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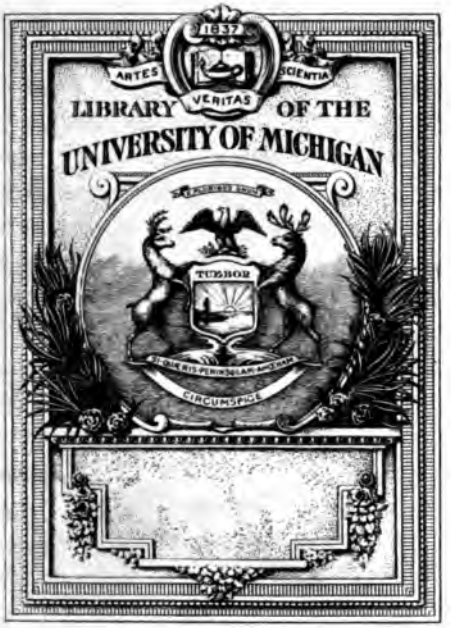
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THE WORKER AND THE STATE

THE WORKER AND THE STATE

A STUDY OF EDUCATION FOR INDUSTRIAL WORKERS

BY

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WITH AN INTRODUCTION BY

ANDREW S. DRAPER

COMMISSIONER OF EDUCATION OF THE STATE OF NEW YORK

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PREFACE

ONCE in my youth I was struggling over the calking of a boat. A neighbor, rushed with the cares of a busy life, extended his assistance. At the completion of his half day of service I asked, with hesitancy, how I could repay him. He replied, "Young man, if you ever have an opportunity to help anyone calk a boat, do it, for only by passing it along will my service become paid."

Men and women, leaders in their chosen fields, have given me freely of their time, inspiration and counsel. If "to repay" means "to pass along," then I am more than glad to offer this book to the public.

ARTHUR D. DEAN.

Albany, N. Y., May 4, 1910.

INTRODUCTION

THE intellectual, moral, political and industrial activities of a people are closely related. They are interdependent. A moral people without mental development would be as insipid as an intellectual people with little moral sense would be undependable. It would make little difference in the end how highly developed a people might be in mentality or feeling if they were not given to work. And neither mental, moral, nor manual energy would make headway without political freedom. These suggestions seem idle because the supposition in each case seems so impossible. Yet it is a matter of degree both in the premise and in the deduction. A people half developed intellectually will be more superstitious than moral, and one not inured to physical effort and endurance will be as lacking in mental and moral as in bodily strength. So a people with wits and moral sensibilities who know the joy of labor will gain political freedom and establish political institutions; and their heads and their hearts and the work of their hands will prosper so long as their activities are sufficiently in equilibrium to hold what they have gained.

It seems as though the people of the United States have understood this thing fairly well. The present generation ought to understand it better than the last or the one before that, and there are some evidences that it does. The part of it which we have not completely realized, or have not known quite how to realize, is the factor which relates to industrial efficiency. We have steadily advanced in intellectual culture; literature, the fine arts, and philosophy are surely abroad in the land. Rational and sincere morality has steadily expanded. We have exercised our political independence until we are beginning to realize its inevitable limitations and to understand how very interdependent we really are. If we have fallen short anywhere it is in the fact that we have allowed our endless natural resources, the advent of labor-saving machines, the glare of the city and its mansions, and our universal ambition for commercial or political advancement, to dull our understanding of the vital importance of widely extended and thoroughly diffused industry and skill on the part of individual men and women.

The causes which have tended to break the equilibrium have been more numerous and more active here than in any other progressive land. Many have seen the difficulty and tried to meet it. It could be met only by government, and government has not responded. While

more and more of every kind of training has of necessity devolved upon the schools, they have persistently, almost blindly, adhered to courses of work which promoted intellectual culture exclusively. Their work and influence have tended almost wholly towards professional employments. Even when the people have demanded that the schools train in the industries, they have responded with manual training departments or schools of a middle or secondary grade, which, so far as they accomplished any substantial end, have trained boys for higher technical schools and headed them for the engineering professions. Indeed, the enthusiastic supporters of these schools have not hesitated to declare this as their purpose, or that the idea was merely to cultivate the mind through the skill and deftness of the hand. Seldom has a school announced that its first aim was to train boys to be real workmen, and girls to know something of the household arts. They have not been trained to help themselves and their country with their hands. That is what is wanted. The rest will take care of itself. It is well enough settled now that there will never be any lack of training schools for all manner of professions in America. But three-quarters of the boys and girls are to do the best for themselves and their country in manual rather than professional employments. And when boys and girls have been trained to be workers, they will not

only be cultured through their work, but in this land of opportunities, they will make such advances toward leadership of every kind as their qualities deserve.

It may also be pointed out that this is not wholly a matter of individual or personal concern. It is a matter of very great moment to the nation. We exercise political freedom in the fullest and largest sense. Every decade brings new evidence that the people expect to use their political power more and more. All that really count in America are workers, either efficient or indifferent. The idlers, either rich or poor, are hardly in the reckoning. If they are in the reckoning at all, the reckoning will still be done by men and women who work. Even more, it is not too much to say that the political policies of this country are being determined, and are going to be determined, by men and women who work with their hands, and essentially by wage earners.

It is vital that this political freedom be used by men and women in whom the mental, moral, and industrial forces are balanced. Before it is, industrial skill will have to be more widely diffused and the general average of it will have to be lifted to a distinctly higher plane of skill and efficiency. We need to get to the point just as quickly as we can when it will not be necessary to speak of an English gardener, or a German mechanic, or a Danish farmer, or a Swiss watchmaker, with special unction, because there will be any number of American

gardeners, mechanics, farmers and watchmakers quite as efficient as any that are to be found anywhere in the world. When that point is reached the Republic will be safe enough, and all the people who are deserving will not only have better and happier and more contented homes, but intellectually and morally they will be a stronger and therefore a more steadfast and dependable people.

It is now clear enough that this will have to be largely accomplished through the American schools. It is so whether the schools wish it or not. The people themselves are making the demand. They have asked bread of the schools before, and been given a stone. That has not been wholly or even largely the fault of the schools. The schools have not seen clearly what to do, and when they do see they can not radically change their work and their plans until the people act in an organized way. The law must authorize and the money must be provided. No matter where the fault has been, or whether there has been any fault, the fact is that great numbers of the plain people have withdrawn their children from the schools before completing the elementary course, for the too apparent reason that they did not think it worth while to have them remain. It is the business of the schools to serve the masses so as to make it worth their while to have their children remain in school not only until they have acquired the elements of an English

education but also such efficiency as will qualify them for some gainful vocation, and a vocation of the hand quite as much as one of the head.

Three years ago or more the New York State Education Department cut loose from established traditional usage in the hope of accomplishing something substantial in this direction. It undertook to bring about an entirely new class of school. Its plan left the great elementary school system intact except that it undertook, by eliminating fanciful exploitation and retaining only the essential elements of linguistic and mathematical knowledge, to provide an elementary course of six rather than eight years, which should be general in character and adapted to all children; with an additional two years' course which introduced new features calculated to gain the interest of children in and enlarge their respect for the mechanical and agricultural industries. Its plan contemplates the compulsory attendance of pupils upon this elementary course until they have completed it. And then the plan sets up the new class of schools, for boys and girls, open daytime or evening, so ordered as to encourage attendance while earning a living in whole or in part, and teaching the fundamentals of every vocation for which there should be sufficient demand in the neighborhood. Of course pupils would go to the present high schools, or to the manual-training high schools if they preferred. The necessary legislation

and the financial aid of the State of New York have been secured, and the development of the new system has gone steadily forward.

Mr. Arthur D. Dean, the author of this book, has had charge of this work from the beginning. For several years he supervised the vocational work in the Summer School of Cornell University as well as in evening schools established by a considerable number of Young Men's Christian Associations in Massachusetts and Rhode Island. He has doubtless traveled more than anyone else in attending educational conferences and meetings of labor organizations bearing upon the subject, and he has addressed popular audiences gathered to consider it in all parts of New York State. His sympathies are with the plain people and he has considered all of the phases and bearings of this all-important matter. He has written comprehensively and what he says deserves the attention of all who want to do what they can for the people and the Republic.

The manuscript chapters convince me that the book covers a much more rational, philosophical, practical and far-reaching treatment of a vital subject than has heretofore been presented.

ANDREW S. DRAPER.

May 20, 1910.

THE WORKER AND THE STATE

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I

PAST, PRESENT AND FUTURE

WE are all familiar with that part of the story of "Through a Looking Glass" where Alice of Wonderland fame, running hand in hand with the Queen and going so fast that she can hardly keep up while the Queen continually cries "Faster! Faster!" asks between gasps of breath: "Are we nearly there?"

As the Queen lets her rest awhile against a tree, Alice looks around and remarks, "Why, I do believe we have been under this tree the whole time! Everything 's just as it was!"

"Of course it is," replies the Queen; "what would you have it?"

Still panting a little, Alice replies, "Well, in *our* country you 'd generally get to somewhere else—if you ran very fast for a long time as we 've been doing."

"A slow sort of country!" says the Queen. "Now, *here,* you see, it takes all the running *you*

can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast!"

With modern industrialism in the character of the Queen and our educational traditions assuming the rôle of Alice we might easily develop an allegory applicable to the present educational and industrial situation in this country.

Gradually we are learning that tremendous industrial forces have been developing with no adequate recognition of the schools and that it will require *all the running that our educational policy can do to keep in the same place and if it wants to get somewhere else it must run at least twice as fast.*

Dependence upon the past.

In our educational practice there has been a universal dependence upon the interpretation of the past, and a general belief that an acquaintance with history, literature, art and Orientalism not only broadens the horizon, but also fits one to meet the changing conditions of modern life and gives an understanding of present-day problems.

Such a policy has been expected to mark indelibly the various callings of life. With it a man was to become a truer citizen, a better employer, a more conscientious workman; with it, the more a man would enjoy his work, whatever

his trade or profession, the more inclined he would be to fit in with the existing industrial order, and the more intelligently appreciative of his civic duties and responsibilities. More than two-score years ago John Stuart Mill in a few words expressed this conception of education as being "the culture which one generation gives to the next in order that the culture already existing may continue."

Altogether it was an interesting philosophy. But is it not incomplete? Has not the present generation obligations to the next quite apart from making it the beneficiary of past experience? Are we not expected to make conscious effort to prepare boys and girls for the future not only by perpetuating what we believe is best in our civilization, but also by anticipating social and industrial conditions bound to exist in the future?

No present path leads to craftsmanship.

In its industrial phases our present generation differs vastly from the last. We see that boys and girls have been led away from the crafts and the home and that they no longer desire to learn a trade of the shop or household; and that individual skill and experience are largely disconnected in the monotonous toil of department store and factory. One of the noblest of callings, that

of tilling the soil, has so far deteriorated in common estimation that a particularly awkward boy is derided by the term "farmer." We find our workers in the factory, in the counting room and in the store, regarding their work in terms of hours and wages with little thought of craftsmanship, for which hours and wages are but the material symbols.

The call of industry.

We have now confronting us a serious problem. We are summoned by the constructive spirit of a busy world to work out a system of education which shall hold a definite and intimate relationship to the industrial activities of life—vast public and private enterprises which are enlisting every grade of human energy and skill, from the foreign alien and unskilled laborer, distinguished only by his badge number, to the captain of industry.

It is possible in a measure to anticipate some of the needs of the future. It will need, as does the present, a general intelligence, a refinement of manner and thought; in common with the present, it will need the exercise of hand skill, and it will need a new understanding of obligation in labor, to individuals and to the state. A thoughtful leader of workingmen has said that boys and girls need a training which will enable them to

earn readily and honestly good wages which they must spend wisely. Now, earning readily implies a technical skill; earning honestly, the industrial exercise of the Golden Rule; spending wisely, a training in manners, morals and taste. The technical skill alone of a craft is fairly easy to master. It is not difficult for a girl to learn to cook, but the art is not wholly mastered if not accompanied by habits of cleanliness, order and economy. To teach a boy to saw, to plan furniture, to adjust machinery, is a simple task compared with that of training in him a social conscience which will make him feel his obligations to his employer and the public.

We have had for a quarter of a century, some form of industrial work in our public schools, but its advocates have carefully avoided any vocational aspect it might have. It has found its place in the curriculum and if at the present time that place be small, it is due in a large measure to the fact that its friends took the path of least resistance and allowed it to become merely a subject in the curriculum instead of providing it with an educational content which would make it worthy of a primary place in our schools.

Handwork as a handmaid.

Undoubtedly, the older conception of manual training was that of handmaid to the academic

work of the school. If the pupil did not comprehend that two and one-half and three and three-fourths made six and one-fourth by the use of arithmetical processes, it was considered a profitable task to prove to him the result in the making of a box. If he did not display honesty, neatness and painstaking effort in writing a composition or taking care of his school desk, many a teacher of manual training asserted that he would acquire these qualities if he made a taboret. If he did not like to soil his hands by carrying coal for his mother, or developed a distaste for chopping kindlings, then sawing boards and driving nails in a school-room would create a love for manual labor and a belief in its dignity. Such manual training has not, and never will have, any effect on industries or the education of industrial workers, for it is founded on a false basis—to accomplish something in a school-room by doing something else. No one can rightly assert that the present courses in handwork in our public schools have no educational, industrial, or social value. They were originally introduced as a part of a new system of education, but either through a general misunderstanding of their import, or because the times were not ripe, they have become merely, as one has aptly phrased it, "a sort of mustard relish, an appetizer"—to be conducted without reference to any industrial end.

Manual vs. industrial training.

At present there is much contention over the relative value of manual training and industrial education. Regardless of terminology, the right kind of hand training in the schools must not only develop in the pupil an absorbing interest in his work and a consciousness of its value, but must give him a sense of his individual relation to the whole industrial system. But the teaching of the use of tools in a corner of a school building for one period a week, with no definite industrial purpose in mind, has about as much relation to industrial training as the making of a coat-hanger has to constructing a modern battleship.

Industrial training need not have technical skill as its only goal, and yet the training for skill must be recognized as of primary importance in establishing a proper relation of handwork to industrial life. Skill is not the only element that contributes to the value of the result; it also involves the way in which the result is reached. For true efficiency there must be no waste of time or energy; there must be a straight-to-the-goal method of working. Courses in handwork should imply a developing of the process of observation and initiative, of a desire for personal excellence of workmanship; of an attitude of mind, both social and industrial. These qualities of head, hand and heart should be at the base of every call

for service whether it be under the name of manual training or industrial education.

Some definite needs.

We are still wandering in the tall grass in a search for some phase of education that will make for industrial efficiency. Before determining the procedure which will bring about the desired end, we may well ask ourselves the question: What is demanded in the industrial world? A prominent manufacturer, speaking with the authority of a national textile organization, recently stated that while the advanced textile ·cols ·which could cover more advanced wc than our public schools, were of great advan.. it still remained true that the preliminary operations of the factory do not require a high order of technical skill; that processes easily acquired when young are almost beyond attainment after a certain age, and that a grown woman can never learn to spin deftly—that the mental requirements are essentially those of discipline. It would thus appear that while there is need for special textile schools there is a larger demand for supple fingers and general intelligence—for the training practicable in the public schools. In the machine trades the call is for a number of broadly-trained men, a relatively larger proportion of skilled men to unskilled men than is required in any other in-

dustry. A machinist and a pattern maker need to have considerable ability to read drawings, to adjust special tools and fixtures, and to interpret mathematical tables and formulæ. Managers in these trades point to the growing demand for special machines which the industry is called upon to build and to the ever-increasing use of automatic machinery. They claim, however, that this development will not eliminate the mechanic of general and broad training. The perfection of machinery calls for more intelligence to make and repair the highly perfected machine. It is true that the mechanic of to-day needs a special training; but he also needs as a foundation for this, the general mechanical principles taught in the public schools. The shoe industry points to a need of workers with a dexterity of hand, arm and back which will allow the body to adapt its movements to those of the machine, the efficient workman being one who keeps step with his machine in its speed and its varying motions of mechanical parts. This industry, in common with textiles, demands a few specially trained men, but the great cry is for workers with dexterity and character. In the jewelry and art metal industry there is a call for more workers with an art sense, with power to originate and execute products with distinctive features in order that we may have a handicraft, individual

and typical. The workers in the forest, in the mine, the multitude of laborers in our public enterprises of subways, streets and railroads speak for themselves, for so far no one has included these vast numbers of workers in any scheme of technical training. They cry out for shorter hours, more pay, a living wage, a higher standard of living. For the most part their education will not go beyond that drawn from the elementary schools. For these, handwork in our public schools can do much; it can develop a *standard of labor-ship* which must be the foundation of any true improvement in the condition of our so-called unskilled laborers.

Broadly speaking, everyone needs to be trained to work, to like it and to do it well. Labor as a factor in education is too important a principle in individual development to be longer ignored. We must not have our boys and girls spend so much time with their books that they will miss an education. In too many cases education is a means to an end—the avoidance of work.

Intelligence, adaptability and appreciation.

Careful analysis of the movement for industrial education will show that it springs from two sources; first, from the skilled industries, those trades where specialized machinery with its differentiation of processes has made so many

machine tenders while eliminating the all-round mechanic fitted for duties of supervision; and second, from all industries, both skilled and unskilled, where there is a need for intelligence, adaptability and general appreciation of work. What is demanded is not only technical skill but a proper attitude of mind. The president of a large railroad remarked in a recent statement that every raise in wages had seemed to be accompanied with a decreased efficiency. The heads of industries which require but few skilled workers when asked what industrial education should do for the mass of their employees, usually enter into a discussion of present-day inefficiency, incompetency, and irresponsibility, implying that the public schools are at fault. When pressed for a solution of the problem and for a definite suggestion they offer some such one as this: Give the pupils an understanding of the industrialism of the city, tell them about the raw material, where it comes from, how it gets to the city, the way it is manufactured, the value of the finished product, the part that labor, the investment and the capitalist play in this process. In short, give industrialism a background that the workers may grow to be interested in and feel themselves a part of the industries that employ them.

With equal force much might be said with reference to the attitude of the employing public

toward labor and those who express it. A notion exists, altogether too prevalent, that education leading to labor is for the son of the "other fellow." When one mentions the subject of training for efficiency, the lawyer, the machinist, the minister, and the farmer all stand in a circle with their index finger pointing to the man at their right.

Arousing the social consciousness.

The time has come for a forward step in education and the significance of the new movement looking to the establishment of industrial and trades schools may be measured by the following brief survey of the present status of industrial education.

As has been well stated by Prof. Elliott of the University of Wisconsin, "the trend of the development of our public school system is determined by the mutual reaction of two forces:—first, a static public sentiment which would leave the existing order undisturbed; second, a progressive consciousness of the new needs of contemporary life which constantly endeavors to embody itself in legislation." This arousing of the social consciousness is nowhere better illustrated than in the endeavor to adjust the American school system to the needs of the new industrial order. This endeavor has recorded itself on the

legislative annals in a number of plans for the elevation of the standards of industrial efficiency. But, of course, laws of themselves do not spontaneously develop high standards of educational efficiency, and such efficiency is not likely to come through the unstimulated activity of public opinion. The National Society for the Promotion of Industrial Education has done much to arouse national interest; for localities and varied interests need energizing through progressive state legislation which recognizes that education is a concern of the state and not merely a local responsibility.

Beginning with the Commission created in Massachusetts in 1905 "to consider the needs for technical education in the different grades of industrial skill and responsibility," six other states have inaugurated special investigations upon this problem. Already the report of this Commission has served to stimulate activity for the reconstruction of old-school programs and the projection of schools with entirely new bases and ends.

Typical state movements.

From the very considerable number of legislative enactments having to do with practical and technical training in schools of elementary and secondary grade, the following may be mentioned as typical, no attempt being made to cover all

legislation dealing with the subject. The State of Connecticut has established two public trade schools, money for the support of the same being provided for from public funds. These schools are located at New Britain and Bridgeport. Recently the legislatures of Georgia and Utah passed resolutions recommending appropriations by Congress for industrial education. By doing this they hope to throw all the financial responsibility on the national government. However, in 1906 the first mentioned state provided for district schools of agriculture and mechanic arts. Maryland in 1908 provided state aid to establish commercial courses in approved high schools. Massachusetts in 1909 reorganized its State Board of Education and abolished its Industrial Education Commission. But the new Board was required by law to have in its membership one representative of the former Commission. A Deputy Commissioner of Education has been selected to have special charge of the field of industrial education. Michigan and Mississippi have passed laws providing for the establishment of county schools of agriculture, manual training and domestic economy. In a revision of the education laws of New York State in 1910 provision was made for the establishment of agricultural and homemaking schools, as well as general industrial and trade schools previously

provided for and supported partly by the state and partly by the locality. New Jersey has followed closely the experience of Massachusetts, having a special commission which investigated the matter of industrial education and afterwards having the new movement incorporated into the older State Board. Oklahoma in 1908 created a system of agricultural and industrial education, while Wisconsin provided in 1907 for the establishment of trade schools within the state, including a state mining trade school as well as such other schools typifying the various industries in the state as local communities saw fit to establish. A trade school has been established at Milwaukee and at present a state commission is working out a propaganda for a wide extension of such schools all over the state. This state in common with Minnesota has a comprehensive scheme of secondary agricultural education with partial state support.

Significance of national appropriations.

There has been a marked movement towards advancing the interests of agricultural colleges. The influence of this legislation according to Prof. Elliott in his review of recent educational legislation for a bulletin of the New York State Library has been in three principal directions: first, extraordinary appropriations for the

conduct of special investigations and instruction including extension work, forestry, mining, horticulture, soil, poultry raising and dry farming; second, the establishment of new schools; and, third, the organization of instruction for the training of teachers of agriculture and other industrial subjects. Perhaps nothing more clearly shows the phenomenon of the action and reaction of legislation and public opinion than a recent and most significant movement indicating that the federal government, through Congress, is likely to become a large and direct influence upon the general educational system of this country, for there has been introduced in both the 59th Congress and the 60th Congress a number of bills providing for the promotion of instruction in agriculture, mechanic arts and domestic economy through federal aid. Unless one has given it some thought, he is in the habit of regarding federal legislation as having but a very remote relationship to the expansion and progress of education at large in the United States. It is time that our educators wake up to the fact that we are establishing precedents with reference to educational administration which may have an important bearing upon a national system of education. Unconsciously, but no less rapidly, we are moving toward a more

or less centralized governmental control of educational institutions, for notwithstanding the absence of direct federal participation in this control, the sum of $14,500,000 annually paid from national appropriations for colleges of agriculture, mechanic arts, agricultural experiment stations and for education in the District of Columbia seems to be a justification for regarding congressional action as an already active factor in the support and development of particular and special educational activities of no small significance to the country as a whole. At the present time the U. S. Department of Agriculture is a more important educational factor than the U. S. Bureau of Education. Where it will end no one can predict. The hopeful aspect of all this national and state agitation toward a movement for industrial and agricultural education is that it points out that education is not merely to be that which the local public sentiment of the present generation apparently wants, but that it is to be that which the oncoming generation will undoubtedly need. Evidently educational inertia in either municipality or state is not to be allowed to hinder national progress in agricultural and industrial development.

A popular movement.

The increasing interest in the subject of industrial education has expressed itself in the editorial columns of the public press; in state and local federations of women's clubs, and in national and state gatherings of teachers. New school buildings all over the country are being planned to provide space for shops and domestic science laboratories. The people of all communities through men's clubs, boards of trade, manufacturers' associations and farmers' granges have come together to consider the question. It is clearly evident to one who makes a broad survey that the movement for this form of education is tremendously significant and that it means much more than would be conveyed by the mere titles. It would seem that apart from the direct question of establishing industrial and trades schools, the term "industrial education" in the minds of the mass of our people simply means the redirecting of our public schools through recognizing that they must be adapted to the needs of our people and that their subject-matter must be taught with an economic, as well as a social purpose in mind.

Evolution not revolution.

In analyzing the arguments presented it is safe to say that the fundamental principles of

industrial education are in keeping with the principles of all effective education, which are in brief: that all effective teaching results from, develops out of or is connected with the experience of the child; that this experience should have relation to vocations or to the pupil's part in life; that every school should be the natural expression of the life of its community. Moreover, industrial education used in its broadest sense is in no way antagonistic to the general function of all education which is to develop and train the mind.

Present contentions.

When it is first presented, no subject seems to lead to quite so much contention as industrial education. At the present time all are aroused over it and some are much disturbed. In gatherings of educators we find that apparently there are lacking clear definitions of the respective fields of "handwork in public schools," "industrial schools," "vocational schools" and "trade schools"; there is a confusion as to its content as to whether it includes agricultural, industrial and commercial training. In local communities there is a fear of making a beginning, the fact being lost sight of that the best in our education has developed out of pedagogical experience and not out of mere discussion. Discussions in

public meetings develop questions as to the relative attitudes of manufacturers, labor leaders and business men. In the council chambers of national leaders in education such questions arise as to whether industrial education shall be in the hands of our present state boards of education or regents, or in the hands of special boards or commissions; whether it is to be incorporated in special schools or in present existing schools; whether trade schools are to be supported by funds received from regular sources or from special sources. Where schools have been started, many points have to be considered, such as the question of making articles of marketable value; and, if so, whether they shall be sold; whether these schools shall coöperate with employers through some half-time arrangements, etc. In fact, difficulties present themselves in a hundred ways and much honest difference of opinion exists. These and many other problems are fully discussed in the various chapters which follow.

An earnest attempt.

It would seem as though the reason for this honest variance of opinion was easily explained. Education is beginning to have a real meaning: it is beginning to teach subject-matter in terms of actual daily life. We are making our first serious attempt to meet, in any complete sense,

pressing economic, industrial and social problems. When we attempt to study the significance of industry upon the life of our people we find that the social and economic problems involved are exceedingly puzzling. In the past it was a comparatively easy task to develop an educational scheme in accord with the ideal of Mill. But today we soon find that the moment we attempt to connect our schools with our industries and the vocations of our people we are confused by the demands made upon the schools. But we must not hesitate.

A new conception.

In America public education is a passion, and rightly so. We shall go forward in our attempt to adjust our schools to the needs of our children and our industries. But just how we shall do it is a problem. Many points must be considered. We must know something of the significance of industry upon the life of our people, of the new position women are taking in the economic world, of the trades union movement, of the educational work now being organized under private initiative in factories and stores, and a score of subjects hitherto considered as being outside of the province of teachers and school administrators.

It is a large matter and one of deep concern.

It means much more expense for public education. It involves a new chapter in our educational theory. It means a serious study of other educational systems. It suggests radical changes in schoolhouses and courses. It necessitates the training of a different class of teachers. Meanwhile before that can be commenced, or while it is being done, there will be much breaking out of new roads, a consolidation of public sentiment, and new laws written upon the statute books. It is a movement full of promise, and some day in its fulfillment, unhampered by educational precedent or dogma, it will be possible for anyone to receive instruction in any subject at any time. Nothing less can be acceptable in an American democracy.

II

THE EDUCATIONAL SIGNIFICANCE OF MODERN INDUSTRY

THE history of industry is the history of civilization, and the progress of mankind is written in the history of its tools. In any study of industrial education a survey of industrial development is necessary. It is important to review the economic progress of a nation, passing as it has, from one stage of activity to another until at length it reaches the diversified and multitudinous complexity of toil of our present system of industry. Such a study should assist us in formulating a new conception of social and educational principles which will not be at variance with the newer laws of production, of distribution and of consumption.

Industrialism at every point.

The work of the nameless digger of tunnels who turns his shovel of dirt under the direction of the mechanical engineer is an expression of human intellect and energy, as truly as any great

and delicate invention like the linotype machine, whose originator has made possible the dissemination of literature and records of human progress to all sorts and conditions of men. Our mechanical civilization presses upon us on all sides. In New York City one can arise in the morning in a house made from machine-pressed, concrete blocks; take a bath from a system of waterworks which is a marvel of engineering, upon which a horde of immigrants was engaged; dress himself in a suit the coat of which alone had thirty-nine operations in its making; wear a pair of shoes which involves over one hundred distinct manual operations and requires the use of forty-five different machines in its making; eat a breakfast of beefsteak and thus closely touch an industry where division of labor has been ingeniously worked out in some thirty odd operations of killing and dressing a bullock; ride down to business on a subway train whose method of operation depends upon automatic switches, signals and speed control; read a paper with the world news as given by telephone, wireless telegraph, messenger boys, printers and typesetters—an industry reaching from the logging camps of Maine and the preparation of the wood pulp to the almost human action of the Hoe press; ride in an express elevator to the thirty-fifth floor of his office

building to dictate into a phonograph his orders of the day, that he may carry on the business of directing the human efforts of twenty-five thousand men and women who are working in a distant city on a manufactured product. Whatever may be the usefulness of all the labor performed, it is certain that a vast expenditure of human energy was saved by the use of extra-human energy in the shape of mechanical devices controlled by human intellects.

Our slave or its slave.

Now shall we be the slave of the machine or make it our slave? Its function is to minister to human needs and not to dominate or control them. Our problem is how to extend the use of mechanical appliances and natural forces to take the place of muscular energy in the performance of the world's drudgery without the attendant abuse—the past negligence of society in counteracting certain social conditions accompanying industrial developments. From this point of view we shall see that no sky-scraper, subway, or intricate machine can be said to represent progress in a modern nation unless it means individual progress to the workers who made these things possible. We no longer accept industrial evils as necessary. There is a growing consciousness among the mass of our

people of their power to control their own conditions.

Thurston says: "Human progress depends upon the ability of mankind to do more work and to accomplish greater tasks; to supply the necessaries of life with less expenditure of time and strength and thus to secure leisure for thought, invention, and intellectual development of every kind." Along these lines a process of reconstruction of society is now going on, and an industrial democracy is the hope of the future. The movement is twofold: on one side an awakened people are forcing industrial issues on the national law-making bodies, and on the other, they are combining in voluntary associations to the end that better conditions of life and labor may be secured.

We see that human needs are capable of infinite multiplication and subdivision. They are never at rest but increase in degree and extent with the progress of civilization. The modern division of labor is ever forcing larger masses into a condition of dependence. The pressure of the means of production is making men's occupations increasingly dissimilar and at the same time it is making the men, as consumers, ever more alike. The manufactured products within our reach are the work of many heads and hands. Are we compensated by the variety of the articles

that makes life richer in pleasures but poorer possibly in the personal equipment of the worker?

Tremendous possibilities.

In economic and social matters many people have very definite opinions on what should be, rather than on what is. Seeing that industry in an earlier shape was accompanied by more wholesome conditions than in its present form, they look upon handicraft as the normal form of industry and ask themselves how that happy condition may be restored. But in our fast changing present how can we strive after an ideal whose realization belongs to the past? An opposite point of view is that of those who believe that the modern system of production has within itself tremendous possibilities for social progress if society, through public sentiment and legislation, will attempt to give the same proportion of brain and money to developing the best in civic life that is now provided by captains of industry for the means of factory production.

We can hardly arrive at an understanding of the significance of industrial development and at ways and means of meeting some present problems until we make a brief survey of the main systems of industry as they appeared in England and as they have taken shape in more recent years in our own country. Throughout such study

one will see the rise of democracy through a revolt against the terrible conditions under which labor has worked and the gradually-increasing consciousness among the people of their power to remedy the evils which they themselves have unconsciously created.

Main systems of industry.

In historical succession there are five main systems of industry: first, housework (domestic work); second, wage work; third, handicraft; fourth, commission work (house industry); and fifth, factory work. It is an interesting development from the first system where the industrial production was in and for the house, from raw materials furnished by the household itself to the last system where the effective utilization of labor divides the processes of production into its simplest elements. In one case, as Bücher says, "All the household had, it owed to its own labor." In the other, as Spencer says, "Specialization in industry arises from a desire on the part of an individual or group of individuals to exploit the remainder of society for profit."

Have we industrial feudalism?

To a certain degree there has always existed in society a desire on the part of a few to exploit for profit the labor of others. The lord of the

manor in old England, surrounded by serfs dependent upon him and his land for their living, is not in an industrial sense different from the captain of industry with his factory system upon which the workers to-day are dependent for wages with which to buy food, clothing and shelter. In the first instance, it was practically impossible for the serf to lease the land from its owner; he was tied industrially and politically. In the second instance, it is nearly as difficult to leave the factory, not because the worker is bound by the bonds of slavery, but because he cannot find elsewhere work which he is competent to do—and he cannot carry with him the machinery for doing it. A steel worker in Pittsburg is not free to ply his trade in Indianapolis; neither can a worker in electrical machinery find employment outside of Lynn, Schenectady, Chicago or Pittsburg. The structural steel erector must go to Panama, to New York City, to Toronto and to other places where the work calls him. In the days of old, labor was bound to man and land; to-day it is bound to corporate interests and the factory. Yet we need not be pessimistic, for the greatest advance has been made in political and social freedom even while we drifted into industrial feudalism. From serfdom to freedom, from whip to ballot, from hovel to cottage, from ignorance to free schools, mark a progress

which should give us hope and courage for further effort.

Housework stage.

In the days of William the Conqueror each of the villages was a self-sufficing, economic unit, the inhabitants obtaining their food and clothing from their own flocks and herds and from their own land. It was essentially the housework stage of industry. Only the simplest arts and domestic manufactures were carried on by the people at large, such as the crafts of the ironworker and coppersmith, the shoemaker and the carpenter. At this time there was no circulation of goods nor capital. There rested upon each household the necessity to satisfy by its own labor, the wants of its members. Its wealth consisted entirely in goods for consumption in various stages of completion, such as cereals, flax, yarn and cloth. It also possessed auxiliary means of production, such as a handmill, ax and hand loom.

Beginning of the wage system.

During the reign of Henry III a remarkable change began to affect the condition of serfs and laborers, for the lords were so willing to accept money instead of labor that a dependent could buy off his service. With this freedom a spirit

of independence began to evince itself as there grew a consciousness of the power of individual labor and its value in the economic life of the nation. There arose an independent class of industrial workers, marking the beginning of the wage system. The worker had, of course, only simple tools and, on account of his lack of business capital, was obliged to work on the raw material furnished by its producer, who also consumed the finished product.

The guild movement.

Next we have the handicraft stage of industry, for the towns had been growing in importance, gaining fresh privileges through the granting of charters and had become quite independent of the lord. They had grown from mere trading centers into seats of specialized industries, regulated and organized by the craft guilds. The guild movement produced greater unity and cohesion among the townsmen and awakened in the workers the idea of corporate unity of municipal and industrial life. Each organization tried to secure good work on the part of its members and attempted to suppress the production of wares by irresponsible persons who were not members of the craft. The instinct of trade unionism had begun to develop. It was ruled that members must work not merely for

their own private advantage, but for the reputation and good of their trade. The guild also trained a limited number of young people in its particular industry so as to secure a supply of competent workmen for the future. In this way there arose the system of each master workman having apprentices.

The distinction between the laborers of this period and those of to-day lies in the fact that each worked not for a single employer but for a large number of consumers. These workmen were handicraftsmen and were distinguished from the factory workers who followed by the fact that they possessed all the means of production and sold for a definite price the finished articles which were the product of their own labor and their own raw material, while the factory worker merely received a recompense for his labor. Essentially the system was one of custom production, the customer buying at first hand and the handicraftsman selling to the actual consumer. Contrasted with the present system the producer felt personal responsibility in the presence of the consumer.

Commission system starts.

At the close of the Middle Ages one finds that the old manorial land system was dying out. Industry had outgrown the bounds of field and

household. England had developed from a wool exporting into a wool manufacturing country. Cloth manufacture was beginning to fall into the power of capitalist employers. This was the beginning of the commission system, for while the day of the factory had not yet arrived it was the practice in the sixteenth century for master manufacturers to employ a number of men working at looms, either in their own homes or under the master's control. This beginning of what, later on, was to be the factory system of production, did not commend itself to the statesmen of Queen Mary's time, for we find that an Act was passed stating that "no persons using the feat or mystery of cloth making shall retain or have in their homes and possession any more than one woolen loom at a time." The preamble to the act has a familiar and modern ring: "The rich and wealthy clothiers do in many ways oppress the weavers . . . by giving much less wages and hire than in times past . . . by letting out the looms at unreasonable rents . . . by setting up looms for unskilled workers and thus bringing to decay a great number of artificers which were brought up in said science."

Work was carried on by the artisan in his little stone house, the wool was carded and spun by his wife and daughters and the cloth was woven

by himself and his sons. The workman was not merely a unit among hundreds of unknown hands. The absence of machinery kept employers and workmen more upon a common level. Village life combined agricultural with industrial occupations. Entering one of the cottages one would find the master of the house sitting at the loom; his daughter at the spinning wheel; the wife at her domestic duties and perhaps one of the sons working in the garden plot which produced their chief articles of food. So it is seen that under the domestic or commission system there was some division of work. The capitalist has not stood alone in his exploitation of labor, for the master of the house saw the economic benefit of working his family. The commission system had its advantages, for it drew loosely together a large number of homogeneous laborers, imparted to their production a definite direction, approximately the same for each and caused the product of their labor to flow to a common point before distributing it in all directions. It left the existing method of production quite undisturbed and merely confined itself entirely to organizing the market. The capitalist at this time was an "entrepreneur" who regularly employed these people in their own homes away from his own place of business. They were either former handicraftsmen who

now produced for a single tradesman instead of for a number of consumers, or former wage workers who now received their raw material not from the consumer but from the merchant. In this manner simply and naturally the commission system grew out of the wage-working and handicraft systems. We shall see how easy it was to take the next step—the development of the factory system.

Coming of the industrial revolution.

We have reached the time of the great industrial revolution. It is a turning point in English industrial history—the time when machinery began to displace unaided manual labor. Hitherto industry had been carried on by numbers of small capitalists who were also manual workmen even when they employed other workmen under them. Meanwhile, there had been evolved a larger class than ever of people who were entirely dependent upon wages with no land of their own to fall back upon and consequently compelled to take what they could get from the nearest employer.

We are accustomed to emphasize the importance of the French Revolution. But during the same period there was a revolution in industry not less serious which brought to England great misery as well as great economic advantage.

The whirl and rattle of machinery and the mighty hiss of steam were to make the country for better or for worse, a battleground of a new era in production—an era of concentrated population, of competitive labor, of child labor, of unsanitary conditions in home and factory, and finally of what in modern times is known as the "exploitation of labor."

Dependence upon the capitalist.

The capitalist now occupied the center of the stage. The workers began to feel the difference between the old system and the new. The new system made them dependent upon the mill owner where formerly they bought for themselves the yarn they were to weave. Moreover, a concentration of population took place. The working classes lost that rural character which had distinguished the domestic system of industry. Now they had to live close by the factory. For obvious reasons, steam could only be generated in a fixed spot and the resulting motive power could only be distributed over a small area, and so it became necessary to have all working people close together in one large building. The artisan was now confined strictly to the factory and the agriculturist strictly to the fields. There was no overlapping of employments. The woman at home no longer found a buyer for her homespun

yarn and conversely the artisan no longer supplemented his earnings by working in the field. The income of the artisan or the agriculturist was limited to the earnings of either the mill or farm.

A record of misery.

The Industrial Revolution, no less than the French Revolution, had its deeds marked in blood. It was a record of cruelty and misery. The low wages paid the adult workers forced the entrance of young children in the mills. When the supply of these children ran short not a few of the mill owners sought the workhouses and under the pretense of "apprenticing" pauper children, secured cheap labor under conditions which made it nothing more or less than child slave labor. The hours of labor of these children were limited only by exhaustion. They were fed upon cheap and coarse food, slept on the floor in dirty hovels, worked sixteen hours a day in heated and ill-ventilated workrooms and were prodded with sticks or lashed with a whip if they dropped from exhaustion. Filth, rags and poverty under the factory system took the place of the neatness, cleanliness and comfort of the cottage under the domestic system. Not only were the factory methods revolutionary, but also the social life of the majority of the producers of the nation

changed, due to the concentration of population in large towns where the mill hand spent his life amid surroundings of repulsive ugliness and engaged in an occupation of wearisome monotony. Terrible epidemics caused by overwork, scanty food and overcrowding, broke out.

Agitation begins.

The crowding of large bodies of people together resulted in a rapid spread of new ideas, new political enthusiasms and social activities. It resulted in dissociating the workers from their employers and aroused a spirit of antagonism which is inevitable when both parties fail to recognize the essential identity of their interests. Agitation for reform appeared and something had to be done. Capitalistic greed rose up in all its power to block the path of reform. Laws passed in 1802 to remedy conditions became a dead letter. The opposition used the now time-worn arguments that profits were impossible if hours were reduced; that overpowering competition from foreign countries would result if hours and wages were changed; and urged the grave danger of governmental interference. Nevertheless, the workmen cried out for the restriction of child labor to ten hours a day; for the prohibition of night work to persons under eighteen years of

age; for compulsory school attendance; and the appointment of factory inspectors.

A voice of protest.

More and more those who have the welfare of workers at heart will turn to the life and work of Robert Owen for inspiration. He was the great and revered friend of the toilers of the world, who in 1815 lifted his voice in public protest against the iniquities of the industrial system. With him, interference was not a question of economic theory, but one of human life. It was about this time that a committee from the House of Commons reported that "no interference of the Legislature with the freedom of trade or with the perfect liberty of every individual to dispose of his time or labor in the way and on the terms which he may judge most conducive to his interest, can take place without violating general principles of first importance to the community, without establishing precedents . . ." But the tide had set toward better labor conditions in spite of the manufacturers who were anxious enough to use the strong arm of the law in their own interests. His bill of 1819 was certainly the first expression of the new doctrine that the state ought to protect the interests of its weaker citizens. From that day to this the advance of the

interests of workers has been on that basis and it has its application to-day in matters of educational and social progress. Of course his policy met with opposition. It was "legislative interference between the free laborer and his employer," and a "violent, highly-dangerous and unconstitutional innovation." In brief, his line of action was based upon three propositions: first, to prevent children from being employed in cotton or other mills of machinery until they were twelve years old; second, that the hours of work in mills of machinery should not exceed twelve per day, including one hour and a half for meals and recreation; third, that, after a period to be fixed, no child should be received in a mill of machinery until he should have been taught to read, to write a legible hand and to understand the first four rules of arithmetic; and the girls, in addition, to be taught to sew their common articles of clothing.

We may well note that with a change in years from twelve to sixteen, a change of hours from twelve to eight, and a change of the three R's to the three H's (head, heart and hands) this bill might well find at the present time a new sponsor. Thus does a new era bring forth new conditions and new needs.

A process of adaptation.

Reserving until later any suggestions as to the part that society has played, and may continue to play, in relieving the conditions of the individual workers, we must give some attention to the various economic advantages of the new system of production. After all, the various systems of industry which have been described are nothing but processes of adaptation that play so great a part in the evolutionary history of the world. The tools have seemed to fit the man all through the history of the race. The processes of production have served to adapt the tasks of human labor to the variety of human power and ability, with a consequent adaptation of individual powers to the tasks to be performed. From a disorganized system of production, suitable to the time, no doubt, the housework form of industry has grown into the factory system,—one which has organized the whole process of production. As Carl Bücher writes, "It unites various kinds of workers, by mutual relations of control and subjection, into a compact and well-disciplined body, brings them together in a special business establishment, provides them with an extensive and complex outfit of the machinery of production and thereby immensely increases their productive power."

Secret of the factory's strength.

The secret of the factory's strength as an institution for production thus lies in the effective utilization of labor. It accomplishes this by the principle of the division of labor. This principle is not new. It existed when the male member of the tribe decided that he could do better by hunting and fighting than he could by drawing water and hewing wood, and so left the woman at home to attend to the home activ . Few things are new in the world but the e new applications and new motives. The . ive of the Indian sprang from personal inclination—that of the manufacturer from getting the world's work done.

In order to accomplish the most effective utilization of labor all the work necessary to a process of production is first divided into its simplest elements. This division of elements may be illustrated in the production of shoes. In the first place, we have the allied industries of preparation of leather, last making, the manufacture of shoe fixings and shoe machinery. Each of these industries is then subdivided—for instance, in assembling the shoe proper we have the departments of cutting, stitching, bottoming and finishing. Again these departments are subdivided, as, for example, in the bottoming department there is welt sewing, sole laying, rounding, channeling, heeling and a score of other operations.

Every factor utilized.

In this way the work of production is separated into the difficult and the easy, the mechanical and the intellectual, the skilled and the crude. It utilizes every kind of endowment. It avoids every waste of strength. It unites handwork and head work. It demands great muscular power along with those operations in which suppleness of the finger, delicacy of touch, keenness of sight come in question. It requires, on the one hand, a skill gained through theory and practice, and on the other hand, those who have never done a day's work in the shoe factory can find a place to work. In early times when these different tasks were placed on one worker a great waste of skilled labor resulted, for the productive portion of the population was limited to those who had mastered some one branch of technique in all its parts. But now by separating the qualitatively unequal labor elements from one another, division of labor succeeds in utilizing the weakest as well as the strongest workers and in inciting them to the development of the highest special skill.

A mighty increase in volume.

The restriction of each individual to a small section of the laboring process effects a mighty increase in the volume of work turned out, for a hundred workmen in a factory accomplish in a

given process of production more than a hundred independent mastercraftsmen, although each of the latter understands the whole process while none of the former understands more than a small portion of it. As an illustration of this principle, Carroll D. Wright once compared the number of workmen employed, operations performed, hours of labor and cost of labor, in manufacturing a hundred pairs of men's medium grade, calf, welt, lace shoes, single soles and soft box toes, in 1863 and 1895. His results showed that in 1863 manufacturing these one hundred pairs of shoes by hand necessitated seventy-three operations by one workman, with approximately 1831 hours of work, at a labor cost of about $458. To make the same number of shoes of similar grade in 1895 by machine there were 173 operations, 371 workmen, the time being approximately 234 hours and the cost of labor $60.

Differentiation of labor.

In general, it may be said that the factory system, with its division of labor, has come into being like other great movements as a natural outgrowth of human needs and conditions. It is a process by which a task is transferred from the one person hitherto performing it to several persons, the transfer being so made that each of these performs but a separate part of the pre-

vious total labor. Division of labor will always be characterized by an increase in the number of laborers necessary for the accomplishment of a definite economic end and at the same time by a differentiation of work. In brief, the economic tasks become simplified, better adapted to limited human capacities; they become, as it were, individualized.

Where have we erred?

There is a general impression that the so-called machine age which is responsible for our system of intensified production is degrading and debasing to the worker rather than helpful. It is generally believed that division of labor, automatic machinery and the piece-work system is the cause of much of the degradation in our large manufacturing centers. It is not to be denied that poverty, viciousness, tuberculosis, crowded tenements and other dangers to public welfare are found in these centers. An ill-ventilated and dimly-lighted textile mill seems to be associated with endless rows of dirty, ill-kept tenements. In the mind of one observer these conditions are the result of the system of manufacture; but another observer in a shoe city where there may be even greater specialization and subdivision of labor may find that these factories are light and airy, provided with improved sanitary facilities,

have rest and lunch rooms, and that surrounding the factory are cottage houses with well-kept lawns and the material appearances of taste and refinement. A state that legislates in the interests of the health and safety of its workers, an employer who obeys willingly the factory laws, a workman with intelligence and skill, a wage scale that is commensurate with work done, a cottage with well-kept lawn and a happy family, may well go together without any reference to the question of automatic machinery or division of labor. It is a fact that several cities having factories which have carried the science of production to the very limit of its possibilities are more representative of what is best in civic life than others which have factories where the processes are manual and individual. Only the greatest of harm can come in ascribing the bad conditions of life in manufacturing cities to the division of labor principle. These conditions exist in spite of the automatic machine. This same machine has within itself an escape from the lower to the higher life as has the city in which it is located. The problem, in common with many others, is one of education, depending for its solution upon a knowledge not only of the benefits of the industrial development, as outlined, but a knowledge of ways and means of eradicating the evils which seem to accompany it. Society has gained

much by its system of production, but it cannot get something for nothing any more than can the individual. The problem of life is to preserve all that is good in any movement or expression and to discover reagents which will clear the solution in the social test tube.

The point of attack.

The point of attack is with the individual worker, his education, his home and his civic responsibility. The industrial system has already done much for him. To many the automatic machine is a godsend, for it has taken those of a lower order and placed them under different and better conditions than before. The operator of the automatic screw machine is a new species of workman, evolved and advanced from a lower class of skill or from a class that has hitherto had no opportunity to develop skill; for out of a mass of immigrants, ignorant and clumsy, the system is making a race of factory workers. Through a greater cunning of hand and a higher standard of living than they ever had before, their minds have been called upon to act. In this way the factory may become a training ground for making over laborers of low grade into workers of higher character and greater social efficiency. But as has already been hinted, it is a problem of education. Never before in all the history of

the world has such a mass of unskilled workers had an opportunity of labor under conditions that can be made favorable. Ditch digging requires no great mental effort and reacts in no favorable way on the worker. It is simply hard work—yet it is individual in its action and requires no machinery. It ought to satisfy those who believe in a return to hand labor. But the same worker may enter a factory and run an automatic machine under modern factory laws, with a decent living wage and a fair opportunity for self-improvement for himself and his children—and we have our citizen of an industrial democracy!

The gate of opportunity.

It has been said that the automatic machine has all the brain and the worker has none. This is a fallacy, for the breath of life has never been breathed into the machine. It is likely any moment to cease to be automatic, and at that moment it requires a brain to adjust it. It needs a drop of oil or the tightening of a nut, and the operative, so recently removed from the ditch, may perform this service, slight in itself, yet so productive of benefit to him if he but exercise a bit of skill and intelligence. At this moment he is on the road to becoming a thinking being and the gate of opportunity (for the American system of factory

organization is open at the top) opens to him. This country does not and should not have horizontal industrial and social stratification. Let the poorest and meanest of operators but think and act and for him advancement begins, provided the community provides the opportunity for it. Moreover, the relation of the total demand to the mass of raw material capable of profitable utilization becomes even more unfavorable with the increase in the number of human beings needing products. Not only is this material limited but the human labor which invests it with the qualities of a marketable ware and increases its quantity is also limited. The share in head work falling to each one engaged in the undertaking of making these products would become at length intolerable were it not possible to reduce it through an economic employment of labor and the worker would not have any mental strength left to apply to his self-improvement. If every factory worker was obliged to do, even if he could, as much thinking as those who are responsible for the whole process of production, he would find himself at the end of the day in a network of mental snarls.

Avoiding wasted energy.

Again, if a product were made by one man it would mean that he would have to execute a frequent change of motions and with every such

change there would come a waste of energy; for passing from one kind of movement to another calls for mental and bodily accommodation to the new class of work, which means an outlay of strength yielding in itself no useful return. With muscular actions pursuing a uniform movement, however, the mind's share in the work can be somewhat eliminated and an automatic performance of those movements soon enters which, with increasing practice, removes farther and farther the limits of fatigue. At the same time the intensity of automatic labor can be greatly increased, so that not only can the movements be continued longer, but a larger number of them is possible within a given unit of time. Of course this sort of work breeds monotony but we have work that must be done and the quicker it is out of the way the more time there should be for wholesome recreation and self-improvement.

Already intensified production has been accompanied by a reduction in the number of hours of labor. One is, or should be, the direct cause of the other. These shortened hours should mean time for family life, social enjoyment and self-improvement. They should emancipate the worker from excessive fatigue of mind and body, leaving the way open for the attainment of technical knowledge and personal culture. We must remember that every operative is just as much

a man as any professional man; he has a body to feed and clothe and a mind to be developed in some direction. His tendencies are upward or downward, as with every other man. Now, what is society doing for these people?

Development of social conscience.

A piece of steel may be forged into a sword or a ploughshare; its form depends upon the idea of the artisan. The kernel of corn may nourish as food or be turned into a drink to poison the souls of men; its use depends upon the idea of the cultivator. Every product, every tool, has its uses and abuses. Both depend on the standards of society and whether the nation has developed a social conscience. May not the automatic machine serve the interests of community and at the same time best serve the interests of the operative?

In itself the introduction of the automatic machine with its intricate movements is no cause for alarm, but the use to which we are putting some of its products and the way in which society is treating its operatives may be of deep concern. The sewing machine is not to blame for the sweat shop, the existence of forty-nine-cent shirtwaists or the sign boards advertising them. Whether we use or abuse the machine is a question of education; not necessarily industrial education or so-

cial education or cultural education, but rather a democratic educational movement working towards the development of thinking and working members of an industrial democracy. Long ago, it seems, Ruskin gave us the word: "We are always in these days endeavoring to separate intellect and manual labor; we want one man to be always thinking and another to be always working, and we call one a gentleman and the other an operative; whereas the workman ought often to be thinking, and the thinker often to be working, and both should be gentlemen in the best sense."

Pay back to the workers.

We have seen how the workers were freed from serfdom by the beginnings of the wage system; how trade unions arose from the guild system; how the factory laws have been made more reasonable and how the modern system of production has spelled opportunity to the Pole, the Slav and the Greek. We have free schools, free press, free libraries, free art museums and public parks provided by and supported from public funds raised by a direct tax upon the selfsame industrial system whose development we have been studying. Society must return to the workers what it has received from their hands. Such a

burden is supposed to lie primarily with the public school, but there is need of securing the coöperation of churches, clubs, betterment organizations, park boards and other municipal and private associations. The popular conception of education is ever expanding and the schools are taking upon themselves or having thrust upon them, new duties, and it is the duty of social, civic and religious bodies to see that the schools have the intelligent backing of the community.

Relation of the worker to the whole.

Now just what may the school do to assist in solving some of the social and industrial problems which have necessarily arisen in the modern system of production? In the first place the school must demonstrate the social necessity of each worker's task by showing him the intimate relation of his personal toil to all other great expressions of human activity. Feeding a machine with a material of which he has no knowledge, producing a product totally unrelated to the rest of his life, without in the least knowing what becomes of it is unquestionably deadening to his intellectual and moral life. If the shop constantly tends to make him a specialist then the school must offset the over-specialization of his daily work, either by preparatory

industrial training previous to his entering the industry or supplemental training after his entrance.

Economic basis for culture.

In the second place, the school must give some phase of effective education which will make it possible for our industrial workers to enjoy the benefits of a cultural education by providing means for it to rest upon an economic basis. Nicholas Murray Butler, President of Columbia University, has stated this point clearly: "It will be a grave error to set vocational training and liberal training in sharp antagonism to each other. The purpose of the former is to pave the way to some appreciation of the latter and to provide an economic base for it to rest upon. The equally grave error of the past has been to frame a course of study on the hypothesis that every pupil was to go forward in the most deliberate and amplest fashion to the study of the products of the intellectual life regardless of the basis of the economic support."

Industrial freedom.

In the third place, the school must provide vocational training that will make for the young worker's promotion after he has started on his industrial career. As a matter of fact, we have

been fitting boys and girls for the factory by failing to fit them to do anything else—a harsh statement, but, nevertheless, true. We have been saying, as did J. S. Mill in 1867, "Education makes a man a more intelligent shoemaker, if that be his occupation, not by teaching him how to make shoes; it does so by the mental exercise it gives and the habits it impresses." Under such a scheme the school was not to attempt to make this man a workman at all, it being assumed that at some time, somewhere and by somebody he was to be taught to make shoes. Consequently, by such an educational system the boy or girl has been qualified on leaving his first school to do but two things—either to go to a higher school or to go to work as an unskilled operative.

No one can have any objections to the boy's starting his industrial career by working on an automatic machine. The crime committed by society has been in sentencing the boy to that machine because educational facilities have failed to provide mechanical drawing, manual training, elementary mechanics and industrial intelligence that would assist him to advance after he started on the machine. Educators have been so fearful of fitting for the factory that they have in reality played right into the hands of modern methods of production at the expense of our industrial workers and to the detriment of society.

Offsetting the monotony.

In the fourth place, school authorities must have a new conception of educational values. Education is not merely a matter of thirty-eight weeks a year, five days in the week and five hours a day; it is rather a question of lifetime, of perfecting the human spirit. The man who toils needs skill of hand directed by intelligent effort. These qualities can be learned in school and reinforced by actual factory experience, but he needs more than that. Schools and other social agencies must provide, through supplemental education, means of bringing variety and breadth of human experience to offset the monotony of toil. A broader social life must come with the narrower industrial life. The industrial efficiency of those who toil is not merely a question of school-shops, half-time schools and evening trade schools, but it depends as much, if not more, upon wholesome recreation, higher ideals, better homes, more effective use of libraries, schools, churches and clubs.

Standing for the best.

As a nation, we have not learned how to play. Only recently have we organized the play instinct of the child into our educational program. The time is not far distant when we shall recognize that wholesome recreation of our workers

has its value in industrial efficiency. At that time the high school buildings with their gymnasiums will not be idle for 180 days in the year, their lecture halls will no longer be silent and their field of knowledge, vocational and avocational, will be limited no longer to those who are taking the "prescribed course of study."

Society has delivered one of its greatest assets to human progress, the furnishing of amusement, over to private enterprise. Recreation has been separated from instruction, and entertainment often stands apart from personal improvement. We complain of the division of labor that has taken place in the factory. Do we ever think of the division of responsibility which has taken place in society? Productive labor is detached from the home and the school; formal education stands aloof from present social problems; the home has reduced its activities to feeding, clothing and sheltering, while private ventures furnish amusements and recreations. Some more sane and helpful adjustment of all these activities is possible in the social organism. Municipalities have their responsibilities and civic authorities must not shirk them. Society has received many benefits from the increased production due to the modern factory methods. It has made possible the creation of enormous wealth which exhibits itself in our churches,

schools, streets, parks and libraries. These institutions must give back to the workers what they have received from the machines. Nothing else is possible in an industrial democracy. A social consciousness is arising among our people that they have in their hands the making of men as well as the making of machines. Every man's work is worthy of a special preparation, both in an industrial and social sense.

III

WOMEN IN HOME AND INDUSTRY

THE peculiarly difficult problem in the vocational education of girls arises from the fact that almost all women will and must, in the nature of the case, prepare for various classes of vocations. The average American girl under present social conditions must serve a part of her life as a wage earner and the major portion of her life as a homemaker. To-day a large majority of American girls are wage earners from fifteen or sixteen to perhaps twenty or twenty-one years of age, after which they undertake homemaking as a career. If they enter upon the wage-earning occupations with no preparation they are destined to have low wages and incur the danger of being exploited. If they enter upon the subsequent vocation of homemaking without preparation the conditions are disastrous to health and to the home.

Two classes of vocations.

Vocational education for girls is no less necessary in modern society than vocational edu-

cation for boys. All women in civilized society should be workers and producers, and in order that they may work and produce well they should have training along the lines of their aptitudes and probable fields of vocational effort. When it is said that all women should be workers and producers, it is of course understood that the largest single vocation for women is that of homemaking, with all that it implies. Consequently, vocations for women may be divided into two classes, the homemaking and the wage-earning.

Women have always worked.

It is popularly assumed that the presence of women in industrial life is a new phenomenon. But, a careful study of their work from early times will show that women have always had their part in productive labor. The different conditions of home and industrial life have brought about a change in the kind of work that women do, but not necessarily any change in the amount and intensity. In early colonial days the woman spun the flax and wove the cloth; now she tends the loom in the mill. Then she made the family soap; now she wraps and packs it in a factory. In many cases she has simply accompanied her industry in its development, in others she has exchanged it for another form.

The past two hundred years have seen a most

interesting development of the economic position of women. In the early days of the eighteenth century the primary interests of our people were agriculture and commerce. Agricultural work was generally done by men. Women for the most part were engaged in the domestic cares of the household, which included at that time the manufacture within the home of a large proportion of the articles needed for household use.

At this period the keeping of the home was a science and an art, although neither consciously. It involved the grinding of corn and the baking of bread; the carding of the wool and the making of the homespun garments; the raising of geese and the making of feather beds. Spinning and weaving, the processes upon which the making of cloth depended, absorbed a great deal of the time of the women and girls of the early colonial period. At first the raw materials were furnished by the household and used in the same household. Later some women spun the yarn only, sold or bartered it to the middle men who put it out again to be woven, and then sold the cloth.

The colonial attitude towards woman's work was one of rigid insistence that they be busily employed in these home industries. The court orders and laws had in them the spirit of a Puritan belief in the virtue of industry and self-support.

Begin to work in the factory.

After the invention of the steam engine there began the revolution of industrial processes. Machines for carding and spinning were invented. Some factories were equipped only with looms while others carried on all the processes of cloth making. Many women still did much of the work at home, having their materials furnished by a manufacturer, to whom they returned the product when finished. It is to be noted that these women were taking over no new employment but that the manner of carrying on the old had been changed. Besides, the work which women had been doing in the home could be done more effectually outside of the home.

As the power loom and the flying shuttle required less physical strength than hand machines, women began to displace men as weavers in the mills and to some extent dropped the work of carding, spinning and weaving by hand. The earliest factories did not open any new occupations to women. The establishment of the factory system simply meant the creation of a larger amount of work which took the women from the home.

It is interesting to note that the cotton mills of New England employed in the early days young women of character and ability from native stock; many of them were saving their earn-

ings to enter the female seminaries of the day, or to pay off a mortgage on the paternal farm. In fact, to large numbers of earnest New England girls, the cotton mill of 1840 spelled opportunity. While the sanitary conditions, both in the mills and in the boarding houses, were far from satisfactory, the girls stayed so short a time and brought such good constitutions from the farms that they seemingly escaped ill health.

Eventually the opening of occupations for educated women meant their withdrawal from mechanical employments of a lower grade. The establishment of state normal schools in Massachusetts and the increasing demand for female teachers started an outward movement of New England women into a new profession.

Past and present.

The textile centers of present New England impress the visitor with a marked change in the character of the mill help. The gentlewomen are gone and in their places are immigrant operatives, to whom the factory system is as much of a relief from drudgery on foreign soil as was the early cotton mill to the Lowell or Fall River girl. There is at least one marked improvement. The advent of a fairly permanent body of factory operatives has brought about an improvement in working conditions which did not especially in-

terest the former workers, who were there for a brief term of service. It is now recognized that large numbers of people will always live and work in the factories; consequently, there are improved ventilation, shorter hours of labor, protected machinery and improved sanitary conditions.

The early fear of the Puritans was that single women would grow up in idleness. The consequences of idle living and the virtue of industry were the cry of the public moralist. Thus the seed of early preachments was sown; now, industry and society are reaping the harvest. The call of the factory for help was welcomed as a means of enriching the community wealth. Women became an indispensable factor in the factory system. It is too late to look upon them as entering a field of employment in which they have no right. The shifting of home activities, community interests, family greed and even court orders have all had their share in forcing them into the factory; consequently any theory that women are a new element in our industrial life is a theory unsupported by facts.

An entering wedge.

The present status of women in industry under the competitive organization of industry presents

a problem which is complicated in a great variety of ways. They have pushed past the traditional activities of home duties. They represent an entering wedge of a new and changing industrial order in which an increasing share of the efforts of factory production will be expended by women. Their entrance into the constructive industries complicates every industrial question and becomes a matter of public importance far beyond the present numerical strength of this company of wage-earning women.

There is the fear that the home has been injured by women entering the factory and store, with the accompanying opinion that all women must be trained for the home. Such a point of view appears to be unshaken by any statement regarding the increasing number of women who are obliged to earn their living; that there are thousands of young girls who are obliged to work for pay in our stores and factories before marriage; and that the home itself has changed along with the changing of industrial conditions.

Breaking down old lines.

It is believed that the employment of women will mean greater competition with men and their work, with a consequent reduction of the living wage. While it is not absolutely true that women

have driven out the men and that they are doing the work of men, it is a fact that there has been a readjustment of the work of both men and women. The introduction of machinery and a consequent evolution of methods of factory production have broken down the old lines of demarcation between women's work and men's work. For example, the textile trades, which historically have been women's work, are to-day shared with men. At the present time weaving threatens to become men's work. Only a few years ago the weaving of cotton goods was regarded as peculiarly the work of women. The introduction of improved and fast looms has so changed conditions that approximately half of the cotton mill weavers in the country are men. The number of places in which women can be profitably employed steadily decreases as the speed of the machinery increases and as the requirements are extended demanding that one hand shall tend a greater number of machines. To a still larger degree, the increase of male mill operatives is due to the number of male immigrants who desire to work in the mills, and to the widening field of employment of women in commercial establishments and in other lines of industry paying better wages and affording opportunity to work in a less taxing and higher grade of industry.

A weak position.

Not only are women prevented by inferior physical strength from competing for certain superior industrial occupations but more generally they are prevented by inferior training and experience. Moreover, their ambition is lessened by the knowledge that they will probably be wage earners for only six or seven years. The tendency to undertake unskilled work which brings them an immediate return, the weakness of women's trades unions, the large number of unemployed and unskilled women and their supposedly lower productivity, are factors which throw light on the question why women are paid less than men and why a large number of occupations have been given over to them with a consequence that men will not attempt to compete with them at all on these levels for work and wages.

Speed and capacity to gain more speed have been the key that has opened the door to a higher wage. A certain dexterity or an inborn knack for the thing they do has given some women an economic advantage over men in portions of some industries, as, for example, in shoemaking. In the colonial period shoemaking was looked upon as man's work. The cobbling of shoes by the village shoemaker, who kept a shop or went from house to house, was exclusively in the hands of

men. From the cobbler shop attached to the house, where one man made the whole shoe, there developed a system of division of labor, when this man became a small manufacturer by the hiring of a few neighbors to work with him—one man to cut the leather, another to fit and sew the uppers and still another to fasten the uppers to the soles.

A new occupation.

Women were never shoemakers in any proper sense of the term, and their relation to the industry began when these small manufacturers discovered that the labor of women and children could be utilized by giving them the uppers to stitch in the home and return to the shop to have the soles sewed on. As a consequence women in or near the shoe towns of Massachusetts became, in a measure, self-supporting by getting uppers to sew and bind. The women carried on a single well-defined part of the work; they did all the work in their own homes; they worked irregularly in the intervals of household duties. In this connection it is interesting to note how history repeats itself, for to-day the so-called sweat shop, occupying a part of a tenement house, harbors a Russian Jew who divides his time irregularly between household duties and an assignment of material from some neighboring factory.

The manufacture of shoes was bound to be completely revolutionized by the invention of the sewing machine and machines for pegging, preparing sole leather and cutting soles. These new machines and the later substitution of steam power had their marked effect on the industry and its workers. No invention changed the work of men so completely as the sewing machine changed the work of women. As machines for sewing uppers to soles and binding parts of uppers together began to be more generally used the rates for work done at home grew increasingly lower, and women who worked at home were gradually obliged to go to the factory and work all day, with the consequence that the industry ceased to be a "pin money industry" which women could carry on in a leisurely fashion at home.

Though shoemaking remains a man's industry there has been an enormous increase in the proportion of women employees. Their occupations are distinctively those of stitching, finishing and packing. The work affords opportunity for advancement because of the gradation of processes and gives relatively steady employment with a good living wage. The industry may be classed as desirable from the point of effect on character. A large majority of both men and women workers are native born. The hours of labor are reason-

able; the sanitary conditions of most of the factories are admirable; the wages, in general, are so much higher than in the textile mills that the girls leave the latter for the shoe factories, which thus continue to attract the more intelligent native-born working people.

From home to factory.

Garment-making, among all the industries which have left the home and ranged themselves in the factories, is of supreme importance in a study of women in industry. No industry would seem to belong more properly to the home, yet it has passed from the home to the factory. From being one of the occupations of women it has become a trade of both men and women. The dressmakers and seamstresses of a century ago have become the shirtwaist makers, the skirt makers, the coat makers of to-day. The development of this industry extends even further. It deals with a complicated group of separate industries such as men's overalls, women's shirtwaists, cloaks, pants and vests, underwear, suspenders, etc.

Needlework of any kind has always been regarded as within woman's sphere, but in a study of the clothing industry we find that many men have come into it. The ready-made clothing industry started with the custom tailor, who em-

ployed his slack season in making up a stock of ready-to-wear clothes. He made use of the services of his wife and daughters. Later the men did the cutting and the women made the trousers and waistcoats. Immigrants began to come into the industry in large numbers. In its nature it was similar to the early stages of the shoe industry. The home shop idea sprung into existence. The tailor divided his work into machine sewing, basting and finishing. The invention of the sewing machine affected the industry as it did shoemaking. The men assumed the more skilled and more difficult portion of the industry and became overseers, cutters, trimmers and pressers, while the women were machine operators and trousers and vest makers.

Men and women.

Garment-making is impartial in the employment of men and of women. The cutters are nearly always men because the work requires muscular strength, knowledge of materials and judgment in the laying out of the cloth. The pressing department is a more contested field between men and women, the former having the advantage of strength, the latter the cheapness of their labor. In the operations requiring the use of the single-needle, power-driven machine the women have the field to themselves, the work

varying from the entire garment system to the division of labor on the cheaper grades of goods. The wages depend upon their speed, and estimates vary as to how long it takes them to earn living wages. In a week's time they can learn to run a machine, but it is several months before they can earn good wages. Theory may be acquired in a week but not dexterity.

As one enters a garment-making factory he is greeted with the roar of wheels and the shaking of the floor. The use of the power machine carries with it its own tenseness. No girl who is incapable of concentrated effort can remain in a garment factory. The air is often bad and the lighting poor, and the noise is always terrific. Some factories with modern systems of ventilation and protection of machinery wheels, are kept within the bounds of decency, and still others are absolutely unfit.

The sweat shop.

In contrast to the average factory there are the work shops in the tenements in which garments are manufactured by the regular occupants of the home, sometimes assisted by neighbors. Men, mostly Russian Jews, are found working at the machines, while women finish the garments by hand. The hour for stopping work is not limited by a time clock system. Often the labor of

the individual stops only when the material gives out. The advent of these Jews in the industry has been an important factor in changing the status of women in garment-making.

At this point one is immediately led into various problems with which the industry is closely connected, such as the sweating system and the legislative attempts to control it, the unsanitary conditions in homes and cheap workshops, and, finally, the whole problem of the competition of foreign labor. The clothing industry has been more affected than any other trade by the successive waves of immigrant labor, and women have felt keenly the pressure of immigrants in the low-grade unskilled work of this trade.

This great industry presents a very difficult industrial and social problem. It appears to be open to attack on all sides—from the crowded tenement with its sweat shop to the noisy factories where there are assembled large numbers of machines in one room. The industry promises a good industrial opportunity for women when the work is carried on in factories or high-grade workrooms with legislative protection as to light, heat, noise and cleanliness.

Where will it end?

Work in a textile mill, garment-making, and shoemaking in a factory, by more or less stretch-

ing of the imagination, can be considered as having some relation to the traditional activities of women. Likewise, there is some reason for believing that fruit preserving, bookbinding, laundering and candy dipping have some bearing upon the sort of industrial work in which one would naturally think that women should be engaged. But women have gained a foothold in some industries that would seem to belong to men. One would hardly expect that women would be found molding metals, cutting files or making glass, yet such is a fact. Little by little industrial forces have called into these factories the female immigrants from Russia, Austria and Poland. These women have not the conservatism of the native born. There is a flexibility in their attitude toward life and toward their part in it. They accept factory positions that girls of other races regard as socially inferior. They consent to do rough and unpleasant work. The Slavic women, for example, having been accustomed to hard work in the fields of their native land, consider work in tin plate mills or screw and bolt works almost a Mecca of opportunity. Work and working conditions which would not be tolerated by American girls have been regarded with indifference by these immigrants. They have not awakened to their real opportunities and responsibilities. Some are

working at wages below the cost of subsistence, for hours longer than the measure of their strength and at processes which will handicap the development of body, mind and soul. What are we going to do about it?

Industrial tides are not swept back by brooms in the hands of well-intentioned people. Of course, the work these immigrants are doing is inappropriate, but it has as its basis an industrial development which makes for cheapness of product. Such an industrial movement so significant of evil consequences to society may not be easily stayed, yet it may be directed and controlled by law and public opinion, grounded on a careful study of industrial conditions and the needs of human living.

Industrial training necessary.

An attempt has been made to sketch briefly the industrial history of woman in three of the principal industries in which she is engaged, as well as to say a word about her entrance into those trades which have been considered as being apart from her field of activity. Her early economic conditions and relationships have been touched upon with the hope of some resultant understanding of the industrial opportunity of the working woman of the earlier times and the progress which she has made up to the present day. Some

phases of her industrial development are very favorable; others cannot but impress the thoughtful person with a sense that somehow and somewhere society has erred. At least one portion of the problem is clear—that the industrial training which formerly came to her in the home must now be received in other ways if she is to play an important part in industrial life. Educational authorities must study ways and means of providing training for industrial efficiency for girls as well as for boys.

Study of women's occupations.

In order to determine the nature of the training which must be given to girls who are obliged to earn a living in these or other industries, one should know what effect the unskilled work has on the industry and its workers, on their standard of living and on their life in their future homes. One needs to study what industries furnish the best opportunities for personal growth and power and what proportion of all women are spending some years of their lives in industry.

Such a study would necessarily be very intensive and would involve, first, the home conditions, occupation and wages of women in the various industries; second, the standard of the living wage; and third, the conditions, opportunities and possibilities of woman in specified

industries. This investigation would strike at the very roots of many social and industrial problems. The definition of a living wage opens up a world of thought. Shall it be limited to the earning of a minimum living wage, or shall it aim at an income sufficient to provide opportunity for that self-improvement which is afforded by the margin of income and by leisure hours? Shall it be gauged by the least wage by which a woman can sustain herself or by the value of her productive power to her employer, or by her value, as a human being, to society?

Claims of society.

At all events, the home conditions, wages and opportunities of employment must be governed by three principles; first, they must keep alive her natural powers so that she will not be reduced to a mere automaton; second, they must develop that kind of efficiency which will be of value to the woman as a homemaker; and third, they must not be detrimental to her physically or morally. For its own strength, society cannot afford to permit its girl workers to receive a wage too low for nutrition or for the refreshment of exhausted strength; neither can it afford to have them working in industries which weaken them in their working life and so react upon their later domestic relations as to leave a heritage of weakness and

inefficiency. Moreover, recreation and richness of life in leisure hours are equally a source of decency and of health, and no industrial success is worthy of the name if its contributors lead lives void of spiritual meaning. Public sentiment cannot rest content with any form of work for women, or men either, which merely makes existence possible. No work, wage nor worker can long stand in the way of the social progress of a people.

Commendable efforts have been made to standardize the health of our women industrial workers through state laws and factory inspections. Recent agitation for a more thorough organization of women's trades unions will tend to standardize wages. The next step is to standardize intelligence. It is a more subtle problem and will react favorably upon a higher living wage, for then women can demand equal pay for equal work because they will have more instances of equal work to show. Increasing industrial intelligence and efficiency gained through industrial education will go far toward raising working women to the position—personal, social and economic—that all who study the problem of women in industry expect to see realized.

An experiment station.

Some experiments have been made in industrial training for girls which are significant and sug-

gest a definite way for their advance and improvement. One of these educational experiment stations is the Manhattan Trade School for Girls in New York City. Its immediate purpose is to train the youngest and poorest wage earner to be self-supporting as quickly as possible. Many of these girls enter industry, as Jane Addams says, "at its most painful point where the trades are so overcrowded and subdivided that there remains in them very little education for the worker." The ideals of the school have been well expressed by its director, Mary S. Woolman, as follows: first, to train a girl that she may become self-supporting; second, to furnish a training which shall enable the worker to shift from one occupation to another allied occupation; third, to teach a girl to understand her relation to her employer, to her fellow worker and to her product; fourth, to train her to value health and to know how to keep and improve it; fifth, to develop a better woman while making a successful worker.

The selection of the trades taught in the Manhattan Trade School was made after a careful investigation of the numerous occupations in New York that are open to women. The present curriculum includes instruction, first, in the use of electric-power sewing machines, including general operating, special machines, dressmaking operat-

ing and straw sewing; second, the use of the needle and foot power sewing machines including dress and garment making, millinery and lampshade making; third, the use of paste and glue including sample mounting, tissue paper novelties and case making; fourth, the use of brush and pencil with work in perforating and stamping, costume sketching and retouching.

In general, it may be said of the occupations chosen that they employ a large number of women; that they require expert workers; and that training for them is difficult to obtain. There is a chance in these occupations for rising to better positions. The wages are good, and favorable conditions, both physical and moral, prevail in the workrooms.

Every student has as part of her trade education such academic work, art and physical training as seem necessary. A worker with skill of hand, reinforced with a general education, has the opportunity to rise in her vocation. An occupation that calls for a little knowledge as well as for dexterity becomes immediately a stimulus to the intelligence. To rise to important positions in factories or stores requires a combination of practical knowledge of the craft, together with ability to utilize book knowledge in rapid deductions, business letters and other trade transactions.

Meeting working conditions.

The training is by no means of the amateur order, for the school has a trade order department where the product is sold to the trade or to private customers at regular market prices. This feature has proved itself to be an important educational factor. Prof. Woolman states that it serves several purposes. It provides the students with adequate experience on classes of materials used in the best workrooms; the business relation between school and market impresses the students with the necessity of good finish, rapid work and responsibility for delivery on time; the businesslike appearance of the shops at work on orders increases the confidence of the employers in the ability of the school to train practical workers for the trades; the system requires business organization and management which in themselves can be utilized for educational purposes.

Great care has been exercised in maintaining the proper coöperative spirit between the employers and the working people. It is always an important question as to the effect such instruction may have on those who are already employed in the industry and who might be disadvantaged by thoughtless actions on the part of the school authorities in placing the girl graduates in positions where a strike is on, in replac-

ing well-paid positions with trade school girls at a less price, or finally, in placing girls at too small a wage for their skill. Such problems are common to the proposed trade schools for boys, but the matter of preparing girls for industrial vocations is especially difficult, owing to the present economic and industrial status of women.

Which shall it be?

Early in the chapter mention was made of the "vocation of homemaking." It is too important an occupation to ignore. Up to this point we have been concerned with women's work in the manufacturing industries. We have seen that in former times the home was practically woman's entire world; that most of what was produced to meet the needs of the people originated there, while all of it found ready consumption within the family circle or by limited exchange. Gradually the home industries, such as the manufacture of dress goods, carpets, bedding, candles, soap, shoes and hats, have passed into the factory. The preparation of food is almost the only work left to the home which may be called creative, unless we include the supreme work of developing men and women. In early periods of American life women were not particularly concerned with the question of whether they should enter commercial life or have a home of their

own. Public sentiment was all one way. At the present time it is in favor of either or both, and no one, and especially no man, is entitled to say which.

The educated woman, club woman or otherwise, longs for a career, for an opportunity to influence the world, and just now it would seem that the greatest field offered to her is the elevation of the home to its place in American life. She may choose the home as her career, not because she can have no other, not because she can in no other way support herself, but because she believes in it as the place and means of educating and perfecting the ideal human being, and because she believes that it is worth while to give her energy, skill and thought to the service of her country and age.

Importance of the home.

Of the five factors which influence the formation of character—that is, home, school, state, church and vocation—undoubtedly the kind of a home provided has by far the greatest direct and indirect influence. Theodore Roosevelt states: "Nothing outside of home can take its place. The school is an invaluable adjunct to the home, but it is a wretched substitute for it. The family relation is the most fundamental, the most important of all relations. No leader in church

or state, in science or art or industry, however great his achievement, does work which compares in importance with that of the father and the mother."

Surely it is a problem to tax the brightest minds, for the making of a home involves economic, sociologic and ethical considerations, if the fullest interpretation is to be given to this social institution. To achieve the best results there must be employed scientific and artistic methods of thought and work. Everyone must live in some sort of a home and is likely to find his chief happiness there. No great advance, spiritual or material, is possible which does not begin with the home. To a large measure, the homemakers of America have the making of a nation.

Home-keeping a profession.

Homemaking should be regarded as a profession. Much illness results from carelessness, ignorance or intemperance of some kind. It is probably true that as many lives are cut short by unhealthful food and diet as through strong drink. The upbringing of children demands more study than the breeding of cattle. The spending of money is as important as the earning of money. Economy does not necessarily mean spending a small amount, but rather getting the

largest returns for the money expended. The homemaker should be as alert to make progress in her life work as the business or professional man.

Extension of the public school.

Recently the public school has undertaken the responsibility of extending its work into the household science field, that the benefit of such organized instruction may reach all women as a part of their general education. When such liberal training is widespread, then the public may expect the rational and justifiable in household procedure where we now have the haphazard and traditional. This much to be desired condition of general understanding and appreciation of the dignity and interest attaching to household activities will come about through a knowledge on the part of every school girl of the laws which interpret the processes and materials used in the home. Such knowledge will be secured to her by her experience during her school days with the utility of the products of her efforts. The school has its place as a corrective of the deficiencies of the home. The leaders of education should be able to foresee the needs of the future citizen and by school training to influence quickly a whole generation. Ready adaptability to changing conditions should make the

school a potent factor, by using its preventive power, in doing away with the results of ignorance.

Lack of industrial spirit.

In the woman's world there has been little organization. Woman has not seen its advantages, and being conserver rather than originator, has seldom gone beyond tradition. The special field in which she lives and works remains detached and undeveloped. It is rather remarkable that for centuries woman has allowed every industry which she organized to pass into the hands of men. The records of invention show that it is always the man who has forced the woman to give up her heavy stones for grinding and try the mill; to use an improved loom; to accept the cook stove instead of the open fire; the sewing machine instead of the needle. The sewing machine has enabled her to put a hundred tucks where once she put three, and every garment is made to hold a wilderness of stitching. Complication, and always more and more complication, has become the order of living; and as if in mockery, labor-saving inventions crowd our houses and demand a new form of skilled labor to take care of them.

From the very beginning of homes or workshops women seem to have steadfastly labored

at complication and men at simplification. A successful business man knows how to adapt means to ends. His office is a model of compactness with everything at hand that can make work swift and easy, and no man will set up any other manufacturing establishment with as little regard to the purpose of it all and to the future success of its operation as he will allow in the inauguration of his household. In all other walks of life, in transportation, in manufacturing, machinery has come in to replace the heavier and more mechanical portions of labor. The steam shovel, the hoisting engine, an infinite combination of mechanical principles, have been applied to the doing of things to save human muscle. The machine age has set free the human laborer, if only he will qualify himself to use his freedom. In the same way the house can make use of mechanical appliances, can harness the forces of nature and bring about a spirit of coöperation which alone can bring the benefits of modern science to the doors of all. The evolution of industry is the evolution of humanity. The grade of labor is its station on the line of evolution, and any form or degree of labor which belongs to a lower period of human evolution is degrading. Scientific thought must be brought into household affairs as it has been into manufacturing.

It has been well stated by H. G. Wells that "the plain message that physical science has for the world at large is this; that, were our political and social and moral devices only as well contrived to their ends as a linotype machine, an antiseptic operating plant, or an electric tram car, there need now, at the present moment, be no appreciable toil in the world and only the smallest fraction of the pain, fear and the anxiety that now make human life so doubtful in its value. There is more than enough for everyone alive. Science stands as a competent servant behind her wrangling, underbred masters, holding out resources, devices and remedies which they are too stupid to use." Science has obeyed the call of factory production. The inventor has furnished automatic devices which make manual labor simpler and cleaner. Women as well as men have heard this call of the factory with the result that there is an increasing scarcity of domestic servants.

The servant question.

The problem of obtaining efficient domestic service is a vital one. The evolution of industry and commerce has been sufficiently attractive to call the girl away from such service. The most modern form of human labor is in the factory. It is surrounded by science and invention, while domestic service stands in our social economy as

the last survival of the lowest form of human labor. As one has aptly phrased it, "the difference between the servant and the factory worker is the difference between obedience and agreement, the difference between submission and acquiescence."

It is a common fallacy to expect that the quantity and quality of domestic service will be raised with the general introduction of instruction in the household arts in public schools. We are in the habit of talking about the "servant question." It is really a service question and at present the servant is the product of the service. The increasing complexity of household life has evolved our household industries to a degree where their proper performance demands a higher order of ability than is found among servants. The present condition of domestic servitude allows only the development of a certain degree of ability, not sufficient to rightly perform our complex domestic industries. When we find a person able to carry on modern household industries, that person will not be our servant. When we find a person willing to be our servant, that person is unable to carry on modern household industries. When the question of household servants is taken up in the drawing-room the discussion is about their inadequacy, insubordination and ingratitude. In the servants'

room, on the other hand, the discussion concerns their inconsiderate treatment, their social inequality or the lack of sane directive power in the kitchen.

Call of the factory and store.

Economic and social conditions control choice of occupations. Domestic service has to compete with other vocations, and when the latter afford better wages or shorter hours or more individual freedom the trend of labor supply will be in favor of the better conditions.

Courses in household arts in public schools will not alone solve the servant question. Such a problem will require careful study of a larger problem,—the problem of women in industry and their reasons for entering it and the means for getting them back again into household service. Such a study will include a definition of what a day's work means in the household; the amount of overtime required and the hours of absolute freedom guaranteed, especially where the position is that of a child's nurse; the providing of a comfortably warmed and decently furnished room, and a decent place and appointments for meals; arranging that the heaviest work, such as carrying coal, scrubbing pavements, and washing, be done through other service; the privilege of seeing friends in a better part of the house

than the kitchen, and security from espionage during such time. This is to be accompanied by reasonable restrictions as to hours and with the condition that work is not to be neglected; and finally, such a manner of speaking to and of the server as shall show that housework is as respectable as other occupations.

Problem of service.

A study of the economic and social relationship between the problem of service in the household and in the industries, achieves a desirable human result, namely, a permanent interest in the organized industries with which the household industries are closely connected. The home sends out many workers into these industries, is dependent on the products of such organized labor and is vitally affected economically and socially by the conditions prevailing among the workers. In this interdependence and the relationship thereby established is the possibility of studying the ethical bearings of woman's work.

Vocation of homemaking.

But to return to the educational, social and economic value of homemaking as a vocation, the household industries may be classified as follows; first, The industries connected with *food.*

These supply the primary need of daily nutrition and the secondary and accompanying one of human satisfaction; second, the industries connected with *clothing*. These contribute directly to protection and comfort and gratify the desire for decoration; third, the industries connected with *shelter*. These are essentially for protection and the maintenance of family life and are directly conducive to the larger social life.

Need of readjustment.

The need in household organization is for a complete readjustment in accordance with modern conditions. If a serious study is undertaken of the various elements which go to make up the daily routine, this adjustment may be accomplished without loss of essentials, and without this basis of knowledge any effort will be likely to cause confusion. In the first place, the home has ceased to be the center of production and has become but a pool toward which products made in other places flow. In short, it is a place of consumption, not of production, and women must take their place as organizers and superintendents of the economic consumption of wealth. All women should know about the wise spending of money, even if they are not familiar through actual personal experience with the laws of production. Very likely if present tend-

encies are maintained they will know about both. We have been accustomed to think that men made the money and so retained the right to spend it. Fortunately, we have recently caught the idea that women might have the requisite skill and knowledge to make money and to spend it carefully. In many instances, it is the woman who spends and upon her rests some of the responsibility of the standards that govern the spending of money for the home and the community. This responsibility is not small. Prof. E. T. Devine emphasizes this point in saying, "It is the present duty of the economist to magnify the office of the wealth expender. . . . There is no economic function higher than that of determining how wealth shall be used; . . . more discriminating choice necessitates more discriminating production." There is food for thought in that phrase. That it is possible to influence production by a wise selection of products is shown by the work of the Consumers' League, which has had its influence upon wages, hours and legislation.

The family budget.

From a long study of family budgets Prof. Ellen Richards of the Massachusetts Institute of Technology found that the higher the income the smaller is the percentage of the cost of subsist-

ence; that clothing assumes and keeps a distinctly consistent proportion to the whole budget; that lodging, heating and lighting have an invariable portion of the income; and finally, that the more the income increases the greater is the proportion of the different expenses which express the degree of well-being. The less the worker gains, the more in proportion he invests in food, renouncing out of necessity all other desires. This last statement convincingly shows that people of moderate income need to make a careful study of the food question, because with every increase in the cost of food production, there is a diminishing amount available for religion, recreation and education and the other interests of the higher life. In this connection it is well to recall the statement of Edmond Demolin: "The most judicious use of money is to form for one's self first of all as pleasant and comfortable a home as is consistent with one's means. Money thus spent is money safely invested."

Women should grasp the connection between the spending of money and the results in the mere physical needs of life. They should not be satisfied until, through exercise of knowledge of the laws of cause and effect, they are able to make their tables wholesome as well as attractive

and economical, their surroundings clean and their clothes properly protective as well as ornamental. These will be steps towards competency in exercising a wiser and broader scheme of satisfaction for other needs no less important.

Animals vs. people.

Reference has already been made to food. The educated woman whose major subject in college was biology often fails to connect the knowledge she has stored up with the best development of her physical life, and remains indifferent to the helpful application to her own living that she might make of the laws she has learned. She treated her laboratory specimens with more care and intelligence than she would dream of giving to her food. Raisers of cattle and of poultry have long known that proper feeding determined the nature of the product. Cows are fed in one way for milk and in another for cream; hens in one way for eggs and in quite another way for fattening for market. Few women have any real knowledge of food nutrients and their proper combinations. To many of them food is a question of amount and variety rather than one of nourishment. It is often the case that where the most is expended for food, the poorest results are obtained in matters of health.

The chemistry of living.

It must be remembered that the full grown adult takes in each day through mouth and lungs about eight and a half pounds of dry food and the air necessary for breathing purposes. Through every pore of the skin, the lungs, the kidneys, the lower intestines, there is a corresponding waste; and supply and waste together in the course of a year amount to about one and a half tons! This food is made up of sixteen different elements. The simplest division of food is into flesh formers and heat producers, the former being often called nitrogenous foods, proteids, or albuminoids, the latter heat-giving or carbonaceous foods. Oxygen is the only one of these that is mainly used in its natural state. Water, which makes considerably over two-thirds of the body, enters largely into the composition of food, and appears in vegetables, eggs, fish, cheese, the cereals and even the fats. The demand for food includes fat, sugar, starch, nitrogenous foods and the salts—meat, fish and potatoes containing phosphorous, lime and magnesia. Potash is given us in meat, fish, milk, vegetables and fruits. Iron abounds in flesh and vegetables, and sulphur enters into albumen, casein and fibrine. It is readily seen that cooking is a chemical process, and enough has been

said to make it clear that a knowledge of the processes and materials involved in the art and science of food preparation has in it all the disciplinary value of the more traditional and formal education along scientific lines, not to mention the more homely, but no less valuable advantages of knowing how to cook.

A well-dressed woman.

The question of clothing is next in order. For a woman to feel herself well dressed is essential to self-respect and moral equilibrium. However, the realization of the term depends on her own ideals and not on the fashion plates. Various notions prevail as to what constitutes a well-dressed woman. One might venture to say that to be perfectly fitted, to have lines and colors becoming to one's figure and complexion, to be wholesome and clean and neat, and to have the clothing a part of the personality constitute an appropriately gowned woman. One might add another quality: to have the price of her gowns fit the pocketbook. It is right and proper to appear in harmonious colors and graceful forms, but the more important life of the soul should not be crippled by the use of too much money and time for this outward show.

A study of textiles.

A sewing course in the public schools will include a study of textiles from their origin in the four essential fibres to their completion in fabrics. Its specific aim will be to interest the girls in this work by relating it to their home, school and community life, that their resulting application may accomplish for them facility in technique and a high standard of excellence in the product. This interest in textiles can be made continuous throughout the entire school course, so many and varied are the aspects of the subject. From the making of mats by the crudest hand-weaving process to the highly specialized tools used in handling elaborate materials, the field of textiles is not overstepped. Such an extensive subject has many possibilities for school program-making. The home is fertile with suggestions for articles, both useful and beautiful, to make up the list of products as the outcome of a sewing course; the school will furnish its share of suggestions, while a large number of community utilities are possible in the needs of institutions, public and private, which repeat the home needs on a large scale but supply the altruistic motive to the students in their work. Processes of dyeing and cloth printing will be taken up by students to give them a basis as consumers for the selection of suitable

and durable material for their purposes. Color, form and proportion will be embodied in every article made. Emphasis on these aspects of the textile subject will not only train good workers through a knowledge of the use of tools and the control of the processes in the making of articles, but will educate women in the choice of proper clothing and furnishing for all occasions, and of good material of pleasing color and design for the money expended. Thus purchasing will become a matter of taste and economy. The reaction on the manufacturer's output is sure to be apparent when knowledge and taste are a common possession of consumers.

Connection with other studies.

The whole subject may become a vital and interesting one by considering its relation to the industrial activities of people and to the phases of life represented by other school subjects, particularly geography, history and art. In this way the ordinary academic subjects may be vitalized. A course in geography can be arranged to deal with the nature of the regions supplying the vegetables and animal fibres, with the cultivation of the raw material and its transportation. History can show the development of the textile industries, the effect on the life of the people working in them due to the inventions in weav-

ing and spinning machinery, and the increasing organization of their work into the factory system as a direct result of these inventions. In this connection the class may discuss the subject of unions of workers and consumers, to bring out the idea that each organization is for the purpose of fortifying the individual's endeavor to produce and consume under the best possible conditions and with the best possible results. Art and design as a correlated subject to a study of textiles is apparent. To choose the beautiful in design, color and form in the furnishing of the home and in wearing apparel, requires training along art lines, particularly in the case of those who are not fortunate enough to live in an atmosphere of beauty.

The house we live in.

And finally, we have the study of shelter. House architecture is away behind shop, office and factory construction. The traditional conservatism of the housewife, combined with ignorance of scientific appliances, and lack of artistic appreciation has brought about this state of affairs. One of the things most needed in a conception of right house furnishing is the elimination of all that speaks of toil. Home is, or should be, a place of rest. Every device that makes work easier should be employed. Mod-

ern open plumbing, enamelled sinks and set bowls, tiled bathroom walls, hardwood floors with rugs, vacuum cleaners, bread mixers, sanitary ice chests, and the thousand and one little inventions or improvements that are now on the market will do much to eliminate toil and at the same time make for better sanitation. Systems of heating and the theories of draughts, should be studied. Likewise, the science of plumbing is important. Women are failing to meet the modern scientific requirements in matters important to health. People have come to expect pure air only out of doors. The possibility of having pure air in their living rooms requires a more thorough understanding of the system of heating. So much of life is spent indoors, ventilation ought to interest everybody, and it would do so if people realized its close connection with health. The science of plumbing, as it is rapidly developing, is another instance of the growing appreciation of the importance of those things so long regarded as mere conveniences. Moreover, we can have beauty in decoration if we only know enough to want it, and girls can learn in school all that is necessary in order to want it, appreciate it and, to a large measure, obtain it if effort is made in this direction.

As a people we know next to nothing of decorative art, and until every young school girl or

woman recognizes that beauty is part of the house and must be learned with no less diligence than is given to other subjects that go towards the making of a home, it cannot be a natural inheritance of a people. It is a poor conception of good art to be satisfied with the semblance of a fire of logs in the shape of an asbestos-covered gas log.

The dignity of it all.

An adequate treatment of these industries would cover a whole system of education; in fact, education means one continuous and increasingly well-ordered relationship with the body of knowledge and the activities involved in the sciences, arts and resulting philosophy of life which these three subjects of food, clothing and shelter comprehend and create. A study in our public schools of the dignity and magnitude of the relationships existing between the household and world industries ought to result in an elevation in the standard of nutrition; a saner, more appropriate and artistic style of clothing; more comfortable and attractive homes; the attainment of maximum efficiency in women's activities at the minimum cost of energy, time and money. It will rest largely with the teachers of these subjects to impress their students with the connection of their work with the economic and social values of processes and results, the ethics in-

volved in points of view regarding work and workers, and the historic development of house industries leading to an intelligent interest in present conditions. Unfortunately, often the technical side of the work becomes so absorbing to both teacher and pupil that neither realizes the tremendous significance of a proper study of the household organization and its relation to social and economic laws.

Wage-earning and homemaking.

A few conclusions need to be drawn with reference to the vocational education of girls. As has already been pointed out, the problem of providing for two lines of training, homemaking and industrial, is a peculiarly difficult one. As far as is practicable, the period up to sixteen should be reserved for school life, and along with the necessary liberal education the latter years of this period should be made fairly rich in the vocational education which will contribute to health and mastery of the home arts and the social knowledge which may be of use later in homemaking. At the same time it must be realized that the girl may become a wage earner in some calling which will claim her attention for anywhere from five to eight or ten years. It is evident that, so far as is practicable, those vocations should be sought for girls, which prepare,

not too remotely, for ultimate efficiency in the home. However, it must be frankly recognized that the vast majority of wage-earning callings to-day open to young women have very little bearing on home efficiency. Obviously, it will remain true that there will be vocations for women which require several years of special preparation. Teaching, nursing, secretarial work and the like offer such careers. Society can afford to provide special vocational schools for those interested in these callings. At the same time we must not lose sight of the fact that the number will be small in proportion to those who must enter the great wage-working callings which have already been briefly outlined.

Vocational education for girls is in its infancy. While more is being said about industrial training for boys, there is no intention to ignore the problem of training for girls. The aim of the vocational and trade courses for girls is twofold: first, to enable them, through the right sort of homemaking training, to enter homes of their own and assume household duties intelligently, perpetuating the type of home that will bring about the highest standard of health and morals; second, to train by means of courses of trade instruction for work in distinctly feminine occupations. Probably the time is not far away

when every girl will learn some specific kind of remunerative skilled work.

The twofold purpose.

There is no conflict between these twofold purposes. It simply means that girls will earn a livelihood in some skilled work during the three, six or eight years after leaving school and prior to marriage, and will do so for their own benefit and the good of society. The earning power of these girls during these years will raise the standard of living in their families and give the impulse to a higher level. It means, moreover, that after marriage the girls will find most useful that home-making training which they had in their vocational school work.

Taking these two points of view together, it is clear that industrial education for girls should embrace those subjects which women should understand and which will be of use in life. Dress-making, millinery and cooking should be taught not only with the idea of enabling girls to direct a household in a better and more economical way, but also to make them proficient enough to earn a living if economic conditions demand it.

Of the 377 lines of employment listed in the census of 1900, women had entered all but 7, in greater or less numbers. Nearly 30 per cent of

the workers in the factories of New York State are women and girls. Bearing in mind that no system of vocational education for girls which ignores the large facts of homemaking can succeed or be defended in the long run, it will be necessary to have housekeeping courses as well as the specific trade courses. The girls will have to be taught to sweep, dust, clean windows and paint; to build a fire and care for the stove, sink and tables; to cook simple, nutritious dishes in family quantities and buy the materials for these dishes; to serve a simple meal and know something of its nutritive value, expense and fitness; to wash and iron garments.

In the trade school courses the girls should be given preparatory training for any trade for which there is sufficient demand. It is believed that it will prove highly desirable to have such courses even if they are comparatively short. Under vocational school conditions even the specialized factory worker can be made to operate certain machines and produce certain results which will give her a decided mastery of herself and her work on entering the factory. These can be made to develop a variety of habits of work which the factory itself cannot undertake to teach her. She can be given an outlook and a certain degree of industrial elasticity which in case of need will enable her to shift from one occupation

to another. They can do much to teach the girl the ethics of her economic life and especially the conditions of maintaining her physical efficiency.

There will be constant danger in the development of vocational education for girls that the standard will be set too high for practical purposes. If the average woman could look forward to being at the age of twenty-three to twenty-five at the beginning of, rather than at the end of, her wage-earning career, a prolonged course of preparation might be desirable—but the facts are otherwise. A few of the many possible courses which might be organized in girls' trade schools are millinery, dressmaking, household design and furnishing, institutional cooking and kitchen management, hair dressing, manicuring, ready-made clothing, bookbinding, box making, glove making, engraving and shirt making.

could be hired for the money, and with an assertion of independence he left his employer.

He was now eighteen years old and looking for a "job," or, shall we say "position"? He found it as a driver of a delivery wagon. His previous experience in knocking around the city had given him a superficial smartness which passes for intelligence. He enjoyed the variety of human interests, the out-of-door life and the hurry and bustle of city streets.

The inevitable result.

But one day he awoke as from a dream. He was now twenty-one years old. His pay was nine dollars a week with chances of advancement to twelve dollars as the limit. He realized for the first time that his hold on the economic ladder was rather slight and that he had not passed very many of its rounds. For the first time he thought that learning a trade was the proper procedure, although his mother had always begged him to have one. He applied for work in a machine shop. Being inexperienced and unskilled he was offered seventy-five cents a day, or as the alternative, the choice of operating several machines which were practically automatic in their action. So he decided to continue on the delivery wagon, and there we will leave him.

All teachers have met many such boys and

John's case is typical of them all. But the reader must not blame him entirely for his decision or for the years that he had apparently wasted. He would not have fared well if, on leaving school, he had applied for a job in this same machine shop, for he would have found that skilled industries prefer boys who are sixteen years old. The employers say that they cannot bother with the immaturity of youth, for they know that the unsteadiness, irresponsibility and lack of training of a youth of fourteen are no compensation even for the low wages which they pay him. Modern production is concerned with the elimination of all possible waste, and too young a worker increases the waste product.

Attitude of parents.

If the boy is not entirely to blame for his course, can we censure the parent? Certainly not all parents, for over and over again, parents say "I want my children to stay in school, to get an education and then to learn a trade." Moreover, if one may judge from exhaustive investigations made by the Massachusetts Commission on Industrial Education, a majority of parents can afford to keep their children in school if in their estimation the training gained is worth while. Based on the family income per person being more than two dollars per week exclusive

of rent, and considering the apparent economic conditions of 3,157 families, this Commission found that 76 per cent of them could have given their children the benefits of industrial training. Based upon the statements of the parents themselves it was found that 66 per cent of the children of these parents could have continued in school, and that 55 per cent would have been willing to send their children to vocational schools. The appearance of the home, of the mother and the children confirmed the statement of the parents and led the Commission to feel confident that three-fourths of the families could and would have permitted their children to remain in school if its work had appealed to them as being of economic value. How many times parents have said, "What is the use of my child staying in school any longer? He knows how to read, write and figure, and that is sufficient; besides, we cannot afford to send him to college and he had better be working and earning money than to while away his time in learning things that will never do him any good." Teachers soon discover that the one thing that every parent desires is how best to make his child self-supporting and he wants tangible results in the product of the schools.

The depth of the problem.

It is readily seen that the problem is deeper than any personal whims of the child or the off-hand opinion of the parents. It is not enough to say that the present educational facilities are ample and that the children and parents are lacking in discrimination concerning their advantages; for the fact remains that the existing schools do not appeal to thousands of young people with sufficient strength to hold them until they can realize the whole benefit to be obtained from them.

It must not be inferred that the public schools are altogether bad, that the philosophy of public education is false, that the practice of the schools is wrong. The school system is far from being a failure, but it must be more adequate and less one-sided; it must be both modified and supplemented. Moreover, it must teach children the significance of a skilled vocation and assist them in exploring their capacities and their tastes and make provision for training them for specific usefulness in some skilled vocations.

Leaving school.

Recent investigations regarding the limited school attendance of children show clearly that a large portion of boys and girls are leaving school at or before the completion of an elementary course of instruction, and the majority of these

children are seeking employment in unskilled industries to their detriment physically, mentally, and often morally. These facts have aroused not only the professional educators but the average layman as well.

One of the causes of pupils leaving school is the lack of harmony between the child's nature and needs, and the curriculum. This is especially true of our courses of instruction for the period of adolescence. As the child approaches this period he longs to do things. Instead of deepening and intensifying its nature at this time through motor activities, thus giving an outlet to surplus energy, we compel him to store his memory with words, inessential subject-matter and things abstract. It is an age when he longs to get out into the world, to accomplish something definite and to be paid as men are paid. Education for this period should be of such a character as to hold the boy in school and thus prevent him from losing the benefits of previous training. The plasticity of child nature is such that the school influences may work tremendous good or evil, for their results are likely to be permanently fixed in the character of the child. Prof. Paul Hanus of Harvard University, in referring to the continuation schools of Germany, France and England, says, "We are the only progressive nation which allows its adolescents—the great ma-

jority of them—to drift without systematic educational influence from the time they are fourteen years of age until they arrive at the threshold of citizenship." (See diagram on page 119.)

Simplification and elimination.

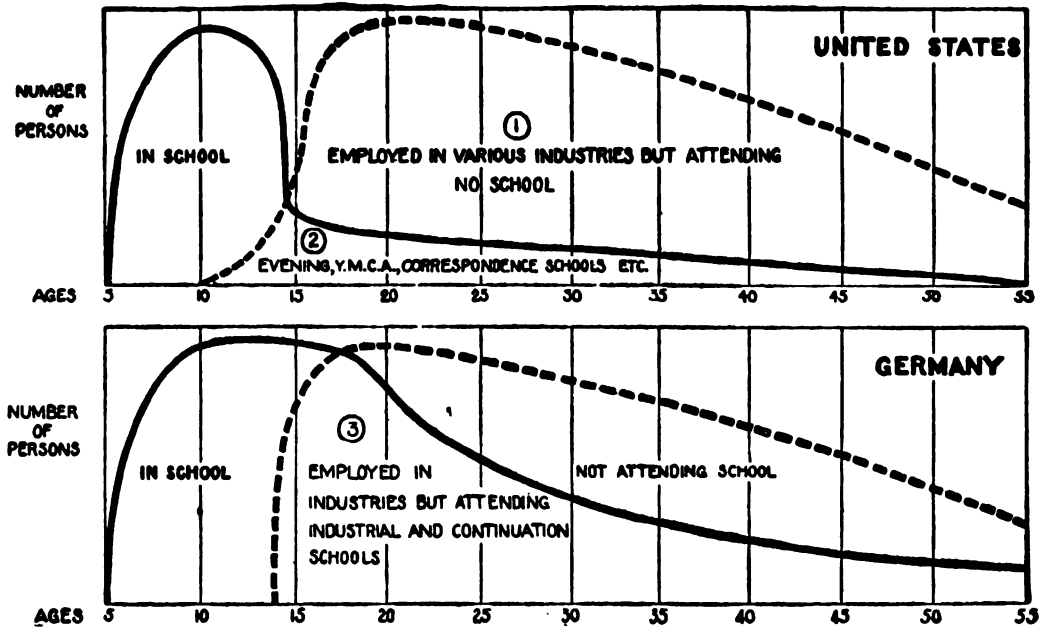
Another fact to be taken into consideration is the overcrowded curriculum. New subjects and subject-matter, important and valuable in themselves, have been introduced without much reference to their relationship to the older material. We have tried to keep the old and at the same time make room for the new without apparently any conception of the sense of relationship between the two and the interdependence of one subject upon another. In order to find a place for handwork it will be necessary to take some account of our educational stock, that we may determine the educational value of some of its subject-matter and the methods of presenting it. Very likely the most important problem to-day in the elementary school is the reorganization of the courses and methods of instruction along lines of simplification, elimination and readjustment of time assignments. A proper study of the industries might well serve as the basis of this readjustment. If properly carried out it ought to bring about more closely unified and correlated courses in arithmetic, history, geography

A Connecting Link between School and Employment.

In this country we find children leaving school for employment in various industries before they are properly prepared. A few supplement their meagre elementary education by study in public evening schools, Y. M. C. A. classes, or correspondence schools. The solid line of the upper sketch shows the record of school attendance in the United States. The dotted line tells the story of employment—how, in some states, children leave school at ten years of age and go to work in the unskilled industries, while the majority in all states leave at fourteen. The school area marked (1) shows the splendid field of supplemental education for those employed but attending no school.

The solid line in the lower sketch indicates the school record for Germany. With the exception that all children in Germany are required to stay in school until they are fourteen, the dotted line of employment is similar to the record in the United States. But the solid line showing the school attendance is vastly different; for the great system of industrial, continuation and evening trade classes in Germany affords means of supplemental education in marked contrast to the area marked (2) in the United States. A comparison of the areas marked (2) and (3) points to the need in this country for some coöperative effort between the school and the factory. While these sketches may not be accurately drawn they are strikingly significant of the new field for educational effort and illustrate the provisions made in Germany to meet a vital educational problem.

CONNECTING LINK BETWEEN SCHOOL AND EMPLOYMENT



and nature study through supplying a need for the information which we have been trying to impress upon the children as being valuable. Nothing will vitalize the study of arithmetic more than to create within the school itself a direct use for its processes. Every step in the development of the lesson in transportation will take on a new meaning when the child sees its relationship to the production of materials good for food, clothing and shelter. Only through some such interrelationship as has been suggested, can the school maintain interest in study, solidarity in the knowledge acquired and efficiency in converting this knowledge into power.

Choice of vocation.

Moreover, the school must assume the responsibility of providing such an education as will assist the child to determine properly what line of human activity he would like to follow or at which he has the requisite ability to succeed. As Dean Russell of Teachers' College states it, "I would have the school help him define the aim of his life in terms of his own natural endowment and possible attainment. The child has a right to this kind of guidance; the school must give it, and what the school gives must be determined by sympathetic instruction

along the lines leading to the goal." The choice of occupations has been left to chance. Some may say that the age of fourteen is too early a period in the life of a child to require him to select a line of work and to prepare himself for it. No one familiar with the spirit and methods of vocational training will presume to say that this training is to fix the child, inexorably, in one groove for life. We must remember, nevertheless, that children do make their choice of occupation and leave school for the mill, the store or the office without any knowledge of their fitness for the work or any preparation which gives them a broad outlook on the chosen vocation. The avenues of choice are open to pupils after they have left the school. May not avenues be provided for a wise selection through commercial and industrial activities within the school system?

The advantage of such training, to review briefly, lies in the fact that it should prevent drifting from one employment to another, by holding young people in school; awakening in them a new school interest by providing a larger amount of handwork than they now have and furnishing means for a wise choice of occupations, thus contributing powerfully to their development.

Types of children.

We must realize that the kind of education which is best for one child is not necessarily good for another. Differences and variations between members of the same family appear early in childhood; moreover, different environment tends to accentuate and increase these variations. There is no absolutely fixed, unchangeable standard of educational values which can be applied at all times and under all circumstances. The educational equation contains many unknown and independently varying factors. How many teachers meet this difference of temperament within the limits of a single family whose children have come under their supervision. The school will have to accept the existence of these manifold differentiations. It ought to recognize that the education which is efficient and appropriate for one individual is often extremely wasteful when applied to another.

In considering a plan for vocational training for the wasted years it is necessary to keep in mind several points.

Cultural vs. vocational.

There can be no division of education into education for culture and education for industry. It will never do in this country to establish a

system of differentiation of school activities in such a way as will bring about divisions of society into sharply defined classes. Vocational education must not crowd out the opportunities for liberal training, nor must the pursuit of liberal education disqualify its pupil for vocational training. Dr. David Snedden, Commissioner of Education for Massachusetts, in recent addresses, has discussed most effectively the necessity of this combination of liberal and vocational education. Unconsciously, but no less unfortunately, we have already developed what really constitutes class education for we have worked out our educational scheme on the basis that those who could absorb the printed pages and pass successful examinations were of the "elect" and those who could not were only fitted to work with their hands. A conception unfortunately now current among some well-intentioned persons, that vocational training is for only the dull and stupid, will do infinite harm. Never should we have a system of education which deliberately separates those who are to work with their hands from those who are supposed to work with their brains. One time at the conclusion of a lecture where I had been explaining the work of a vocational school, a principal of one of the local schools stepped up to me and said, "I have just the boy for such a school." Naturally, I sup-

posed that he referred to his own offspring. I soon learned that he had in mind a poor unfortunate specimen of imbecility, very large for his years, very backward in his grade, fourteen years old and spending his third year in the fourth grade. This school man saw in vocational training nothing but a scheme for turning into our industries a selected lot of material suited only to the requirements of an asylum for mental unfortunates. Such an attitude is a direct insult to laboring men. Industries need intelligence as much as commercial establishments.

We must recognize that there are many processes by which children can be educated, and one process may be best for one group and another process for a different group. But all processes are to be in the name of education. The solution will only be complete when we make the most effective adjustment possible between industrial and liberal training. While we are bound to recognize these several groups of children we must give each of them that training which will render them efficient as citizens, as producers and as men and women of culture within their individual measure of capacity and opportunity.

Every child possesses some strong interests or instincts which may be made the basis of personal culture, and any tendency to separate work

from culture, or culture from work, in the school programs may lead to a similar division in the program of life after leaving school. The production of a well-rounded industrial citizen will not be accomplished by so arranging a school program that the impressionable child obtains the idea that one hour he is being "culturized" and at another hour is being "vocationalized." There is no man, however skilled he may become in his vocation, that will not need the refining and humanizing influences which come from a love of books, of art and of nature. Undoubtedly the greater his skill the more time he will have for leisure and the larger the investments he can make for personal culture.

Social significance.

Again, the subjects in these schools should be taught with reference to their social significance as well as to their vocational bearing. The child should feel that school studies have an important bearing upon life. The cost of the Panama Canal, the number of its workers, the years taken to complete it, are of little value as compared with a knowledge of its commercial importance and the method of its construction as applied to the lives of those who are to reap its advantages, as well as those who accomplish its construction. Likewise in the study of history it is of little im-

portance to know the lines of battle, the dates of engagements or the numbers on each side; the important thing to society and the individual is the progress which was made in a movement toward the betterment of mankind and how far have we gone toward a government of, for and by the people. Arithmetical examples in taxation mean little if they deal with only the number of mills on a dollar or the number of cents per hundred of valuation. But the large questions of how the money is raised by taxation, what bodies of men spend it and are responsible for it, are of tremendous social significance. Again, the date of the invention of the cottongin and the name of the inventor can by no possible stretch of pedagogical imagination equal in social and industrial value a close study of the effect of this invention upon the life of our people in the way of new products, new social conditions and the accompanying new social and industrial order.

General aim.

To sum up in a word, the general aim of vocational education, for boys and girls between the ages of fourteen and sixteen is to render them of greatest advantage to the community by training them for practical work and by securing at the same time adequate development of the mind. Consequently, this training will not devote itself

entirely to the teaching of so-called industrial subjects. Principles of citizenship, history of the country's achievements, mathematics, language and other general knowledge will find a lodging within the curriculum of these schools. Industrial training should not begin until after the ordinary school subjects like reading, writing, spelling, drawing, arithmetic and the rudiments of history, geography and nature study are fairly completed. Neither should it begin until after the pupil is ready to handle the lighter tools of industry safely and to acquire skill in their use. From one-third to one-half of the school session should be devoted to those studies which will bring about an appreciative understanding of the resources and problems of our civilization and the power to deal effectively with them. Such a program will result in the children's knowing something about many things and a good deal about something. By one they may earn a living; by the other they are expected to live a life of completeness. For within the measure of individual capacity and opportunity these boys and girls are to be, not only efficient producers, but also useful citizens and persons of culture.

Length of course.

The length of course will necessarily vary in different localities. It will depend upon the eco-

nomic pressure of the families concerned, the status of the existing school system and the nature of the local industries. A study of child labor laws in the country shows a marked difference in the state of public enlightenment regarding the value of schooling as expressed in law. Those states which place the limit of compulsory education at twelve years of age can hardly expect to have their consciousness aroused in a minute to the need of a four year vocational course. The children of such communities will be fortunate if they are provided with even a two year course of vocational training. Eventually we may expect that in a country as economically resourceful as America, the age of entering upon industry for all children may yet be raised to sixteen.

Arousing industrial interests.

The growing power of children is greatest and their earning power least between the ages of twelve and sixteen. At the same time it must be kept in mind that real trade training can hardly be given until the boy or girl is sixteen. In general, the years from fourteen to sixteen should be given to laying the foundation of industrial efficiency and to arousing a set of industrial interests that will demand the work of the next two years, or from sixteen to eighteen, for their

fulfillment. In other words, general vocational training for the first two years and specialization the last two years. By the time the child is sixteen he should have developed an interest in industrial subjects and should have determined the line of mechanical work for which he is best fitted. Then at sixteen he should fit himself for a trade pursuit. Under ordinary conditions the period of vocational training between fourteen and sixteen must necessarily be limited to its elementary or unspecialized forms of expression. The general nature of the industrial work will give the general intelligence and adaptability which are so much desired by employers. It is possible to organize the majority of specialized occupations into a number of groups, each one of which represents certain distinctive rudimentary processes connected with common materials. These general processes will later admit of subdivision in the various activities which go toward making up the highly specialized industries.

Scheme of instruction.

Assuming that the course of study of the first six years of the elementary school has contained its fair proportion of manual arts, the vocational training corresponding to the seventh and eighth grades will lay added emphasis on hand skill.

With this handwork there will be offered related lessons in English, geography, history, physics, arithmetic and drawing. The demands of industrial life and not a traditional school course will determine the nature of the shop course. Six hours of instruction each day is none too long and the program of study can be so arranged by alternating theory and practice as to prevent the work's becoming fatiguing. Everyone knows that these children would be working nine to ten hours a day in some mill or store if they were not in school. In order to avoid the dissipation of attention and energy which now obtains through many subjects and many periods, the school day should not be divided into short periods. Application should be taught before theory and the pupils will learn only the essentials of subject-matter.

General intelligence is to be acquired through a coördination of industrial work with academic classes. (See diagram on page 133.) It is not necessary to eliminate any important book studies, but these should be industrialized and socialized for the sake of economy of effort and better understanding. As the industrial work for boys and girls is different, it precludes any attempt at giving classes of boys and those of girls exactly the same treatment in any subject.

The "bookwork."

Without going too much into details, the English will aim to develop wholesome tastes in practical people and enable them to give plain and forcible expression to thought. English composition will provide much practice in writing business forms, including letters of all kinds, also theme writing for practice in simple direct expression of ideas formed through experience. A command of English is as much a tool of a trade for the prospective cabinetmaker as his plane. It should be the simple, direct sort of English, both written and oral, in which workers give and take directions. The work in arithmetic will be of the sort that gives power and knowledge. It will aim at accuracy and speed in the fundamental operations, power in simple mental calculations, mastery of common fractions and decimals, facility in practical applications of the tables of weights and measures, and finally, acquaintance with business forms and customs as found in shops and stores. For the boys, arithmetic will find its applications in such problems as deal with the speed of machines, weights of castings, percentages of alloys, the subject-matter depending of course on the leading industries of the locality. For the girls, there will be the treatment of household accounts including cost of food, fuel, service, rent and typical family

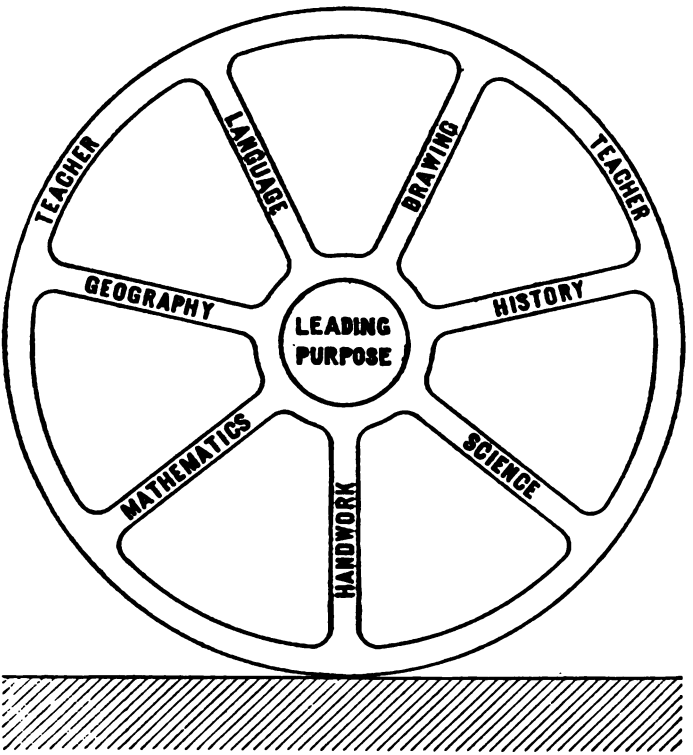
A graphical view of inter-relations.

An industrial school must be organized in accordance with the leading purpose. This purpose may center around a chosen trade or group of trades. The organization of subject-matter in such a school may possibly be made clear by considering a diagram modeled after a cart wheel.

In the position of the spokes as shown it is assumed that "handwork" is being taught, but the pupil cannot study the subject properly unless it comes within proper relation with science and mathematics. These subjects like the spokes of the wheel must bear a part of the load. At the same time other subjects such as geography, language and history, are under a reaction much as in the case of the upper spokes of the wheel.

As new subjects come into vertical position, each one becomes in turn a center of effort but related to all the others and always connected with the leading purpose.

INTER-RELATION OF SUBJECTS IN THE VOCATIONAL SCHOOLS



budgets. The history and civics will have for their general idea the development of the industrial citizen and consequently will lay the emphasis upon the industrial or economic phenomena of our national development rather than upon its political and military aspects. Stress will naturally be laid upon the development of transportation and communication, the establishment and growth of cities together with their new code of civic life, the changes brought about by the concentration of capital and labor in production, and the civic duties and privileges of the modern industrial citizen. The educational content of facts concerning industrial and economic development is greater than that of facts relating to wars, boundaries of states, or development of political parties. The geography will center about collections similar to those furnished by the Philadelphia Museum of the raw materials of commerce such as may be gathered and classified by the pupils. The collections may be, for the most part, put up in glass bottles of suitable size, and illustrated by cuts from magazines which show the processes of their production and their preparation for commercial use. Textiles, gums, minerals, oils, woods, leather, rubber, threads, etc. may be shown both in their native forms and in the various stages of their manufacture. When geography and nature study are

thus centered around the commercial products of the world it is readily seen that they become concrete, stimulating and broadening, while at the same time they make the pupil intelligent concerning the industries of mankind as a whole. The geography of the world should be taught in the products and imports of the locality, through the materials used in the school. The work in science will be necessarily differentiated according to sex interests. The boys will study elementary physics, mechanics and electricity with reference to their practical application to the machinery in the school and in the locality. Meanwhile, the girls will give attention to that portion of science which comes under the terms of sanitation and household management, as, for example, the various types of plumbing fixtures, the action of alkalis and the removal of stains.

The "practical work."

The handwork for boys differs from what is ordinarily the conception of manual training. However valuable a limited amount of handwork may be for general educational purposes, it remains true that to give but one and one-half hours a week to such work is to make it more of an entertainment than an industrial training. The time is too short to achieve the needed skill, or to lay the foundation of enduring industrial

interests. In the vocational school from three to five half days per week will be devoted to such training. The skill and knowledge that will be thus acquired and the interests that are established will go far toward making both parent and pupil see the desirability of additional years in school in order that there may be a better preparation for industrial life. It is expected that the handwork will center around direct applications to the local industries. There will be sheet metal work, tinsmithing, soldering, gas piping, metal spinning, electric wiring and speed lathe work, both in metals and wood. The handwork will be in accordance with the best shop practice. Such a course should cultivate habits of close observation, a high ideal of what constitutes honesty in workmanship, habits of accuracy and industry, knowledge of materials and types of construction best adapted to a given purpose and skill in the care of tools and their use in industrial processes.

On the practical side, the course for girls will include household arts, sewing, millinery and garment making, freehand drawing and design. Through such a course the girls will be led to become economic and useful homemakers, besides having the training which will allow them to fill positions as milliners and dressmakers' apprentices. Interests in other vocational pursuits may

be aroused as need of preparation for them appears. In brief, the practical work will teach the girls to care for the house; sweep, dust, clean windows and paint, build a fire and take care of the stove, sink and tables; to cook simple nutritious dishes in family quantities and to buy the ingredients of these dishes; to serve a simple meal and know something of its nutritive value, expense and fitness; to wash and iron the garments made in the sewing classes, the aprons worn for school work and the towels, table mats, and curtains used in the house.

The drawing will lay its emphasis not upon representation—i. e., the mere copying of works of art or of the picturing of objects of nature or manufacture, but upon inventive design, both in freehand and mechanical drawing. The industrial drawing will aim constantly at the graphical expression of original creation rather than even the most faithful imitation. In this way the student will be best prepared for all those forms of drawing that later find their true application in the various practical arts and handicrafts.

For the boys the drawing will consist of the practical application of mechanical and freehand work to parts of machinery, house plans, etc. Emphasis will be placed upon the reading of drawings, making sketches of machine parts

quickly and accurately and upon having all school drawings in accord with modern drawing room practice. For the girls the drawing course will attempt to apply the simple principles of design and color to the work in the other classes.

The girls will design and stencil curtains for the dining and sewing rooms and will make designs for doilies for the table. They will plan attractive spacing of tucks, ruffles and embroidery for underwear and will select combinations of color and trimmings for dresses. They will also make designs for articles used in the house such as candle shades, pillow covers and the like. These designs will be executed in their other classes.

A record of graduates.

Fortunately, one can turn to the records of several schools that furnish evidence of the value of such training as outlined. The Hebrew Technical Institute, New York City, was founded in 1884. It takes boys who are fourteen years of age, who have completed the seventh grade of the public schools, and offers a three years' course in shop and book work. All the boys pursue the same course for two years, specializing during the last year in woodworking, metal working, electricity, drawing, etc. The following table of occupations of the 782 living graduates shows

most conclusively the nature of their training and their success in accomplishment:

Pattern and model makers	4	per cent.
Machinists	7	"
Instrument makers and general mechanics	10	"
Electricians and electrical mechanics	16	"
Draughtsmen	16	"
Architects	4	"
Manufacturers	2	"
Foremen and superintendents	11	"

Forty-two per cent of the graduates who have been out of the school ten years or more have risen to be foremen, superintendents, managers, or proprietors.

Teachers and students	5	per cent.
Clerical positions	19	"
Reports not received	6	"

Their average weekly income as reported on the eve of the twenty-fifth anniversary of the school, is significant:

	Number of graduates.	Deceased.	Present average age.	Present average weekly income.
1886	19	2	39	$50.00
1888	11	1	38	38.00
1889	17	1	37	40.00
1890	16	1	36	50.00
1891	19	–	35	42.00
1892	35	4	34	35.00
1893	26	2	33	32.00
1894	31	–	32	37.00
1895	33	2	31	37.00
1896	34	1	30	38.00
1897	19	2	29	35.00
1898	30	–	28	29.00

	Number of graduates.	Deceased.	Present average age.	Present. average weekly income.
1899	31	4	27	29.00
1900	35	–	26	28.00
1901	40	–	25	26.00
1902	34	–	24	24.00
1903	46	2	23	20.00
1904	62	–	22	18.00
1905	63	–	21	17.00
1906	59	1	20	12.00
1907	73	–	19	10.25
1908	82	1	18	7.25

Total number of graduates 805; deceased 24.

An experiment with girls.

Several years ago the Principal of the Hancock School, Boston, made an investigation of the life work upon which the girls of her school entered. She found that many did not enter employments which contributed to their development in any sense of the word, either physically, morally or intellectually, but that they drifted about from one unskilled occupation to another, gaining little or nothing in efficiency and never becoming able to earn a respectable living; yet they continued to leave her school, "merely staying until the day they were fourteen that they might rush into some kind of work." She felt that the introduction of a larger amount of industrial work related more closely to the girl's

life either for future work or for home living, might arouse a new interest in school and aid in a wiser choice of occupation than otherwise would be possible. With this in view, fifty girls were selected from the seventh, eighth and ninth grades. All were given a choice between their regular afternoon school program and the industrial work at the North Bennet Street Industrial School. The attempt was made to arrange the program so that as much as possible of the heavier work, arithmetic, geography, history, English, reading and literature, should come in the forenoon, while some of the reading and personal hygiene and gymnastics were to be included in the afternoon period in the industrial school.

The courses in housekeeping, sewing and design were similar to those previously outlined. In all three of these activities no opportunity was lost to apply the bookwork of the morning program and to emphasize its use. There was constant practice in measurements and in estimates of cost in both sewing and cooking. In writing recipes and describing processes used in the work the writing and composition were criticized for use of good English and good spelling. A greater freedom for conversation in the workroom made possible helpful lessons in the correct use of spoken English.

That the girls became more keenly interested

in school work and thus remained in it a longer period after their fourteenth birthday is at least evident from the result obtained from the first class of fifty girls. Twelve of the eighth grade girls reached the age of fourteen during this year. Two of them left school—one went to work and the other wanted to continue with her industrial class but preferred to leave the public school. Out of the eight girls of the seventh grade who reached the age of fourteen during the year, three left to go to work. Two of these claimed that they would go on with the industrial class if they could. Of thirteen sixth grade girls who reached fourteen, three went to work, but one of these, after several weeks of absence, reëntered public school and came back to the industrial class.

It was hoped that the school might help the girls to determine more intelligently their future work and to direct them into a higher grade of occupations. It seems to have served this purpose, for when the class first went to the industrial school the eighth grade girls were asked what they intended to do after graduation, and the returns showed only three out of the twenty planned to go to high school—the others planning to go to work or to remain at home. Shortly before the school year closed the Principal asked the girls to answer certain questions with refer-

ence to plans for next year—among them the following: Do you expect to go to high school next year? If not, and there were a school where you could go to learn more about dressmaking, millinery, cooking, etc. would you go? The returns showed that seven intended going to high school, one to business college, eleven who would go on for more industrial work, and two who did not know. To further test the value of the work each pupil was asked to write a paper, and among other things, to state frankly how she felt the industrial class had helped her and to say which interested her more—the public school or the industrial school, and why. They were urged to give their honest opinions and were assured that no marks would be given them on the papers but that by speaking freely they might help the teachers to determine the sort of work which would be profitable to the girls in the last years of school. The answers were helpful. In a few cases the girl favored public school, because it prepared for a commercial school where one might become a typewriter and enter an office rather than a workshop. In nine-tenths of the papers the pathetic expression was used, "the public school studies help us to graduate;" and the comparison was made that the industrial course would help them to earn a living, to be useful at home and to know better how to buy

and prepare food and clothing. There was only one dissenting voice regarding their enjoyment of the class and all expressed the willingness to remain in school if more of such work were given.

An end to bring about.

The school—vocational or general—must help every child to grasp his best chance. To do this it must know for what it is aiming and must have a better understanding of the principles which it is trying to carry out. Every child must have an elementary education and before everything else this education must mean the power to read and write and master the simple processes of figuring. Its work must have a definite aim and its ends must be assured. Before a child is permitted to leave school it should be known that he has a definite possession which can never be taken from him.

The work of the school must be more intensive and at the same time simpler and more definite. It is wrong to waste the time of a child. Moreover, it is unwise to attempt to impart mere information. If the child has the elements which give him the power to get this information, he will get it when he needs it or when he wants it. For example, the use of the metric system is merely a matter of ten minutes' study when it is needed in life provided the individual has the

power of applying a simple rule of moving the decimal point and the understanding of the table of metric measures.

The child must be given the opportunity to learn a vocation after he has acquired the simpler work of the elementary school as outlined. The school system must provide schools that train for every vocation for which there is a reasonable demand. And in one of these the child must remain until there is ground for believing that he has found the calling for which nature and his own effort have prepared him.

He must know that he is not to drop out and not to be allowed to waste his time. The schools must carry him as far as they can be of help to him under the conditions of his life. Moreover, he must get the larger part of his culture through his work. It will be a finer and truer culture than can be gained in any other way. Culture which comes through mere instruction is good, but it is secondary and must wait upon the essentials.

The real test of the value of vocational training will be that it shall make the boys and girls free to advance to higher positions and not leave them tied forever to a cog of the vast industrial system. It is not only the type of training that will get the boy or girl into the job that is wanted but that which will enable him to get

out of that job into a better one in the same line of business. The training must be broad enough to train the head, heart and hand to individual and social needs. For the school period of a child's life between the age of fourteen and sixteen, his supreme need is for a series of interesting school occupations. This need the handwork can meet to a large degree. In order that the period after school life may not suffer from a lack of wholesome interests vocational training must include that which will enable each child to appreciate and develop in himself some aspects of personal culture.

V

TRADE SCHOOLS AT SIXTEEN

LONG ago Carlyle said that the proper theme for an epic was no longer "arms and the man" but "tools and the man." To-day in the educational world, at least, we need to be reminded that in our intellectual fervor we have forgotten the hand. But threatened commercial invasion from foreign shores, a realization of the scarcity of skilled labor, the specialized tool with its over-specialized man, new educational ideals and methods, have driven us again to recognize the value of the tool and the man as an instrument of civic and economic growth. In slighting the hand in education we have neglected the man. In our comparatively new and over-fed nation, the oversight has in the past produced but little harm, for the competition of the world has not been felt within our borders and an over-indulgent Nature has made it possible for us to ignore the baneful effects of such an inadequate conception of education. We have been very happy-go-lucky over our educational creeds. We have assumed that learning was

meant for brain workers only. If a man was to be a lawyer or a physician or a clergyman then he must be educated, but if he was to follow business or trade then he needed only to know a few of the elements of learning and then to entrust himself to a kind Providence or chance to guide him to his destiny. The old notion of schools has emphasized books not boys, and it has tended toward letters not toward living.

Work dignified.

Only recently have we brought ourselves to see that the industrial worker needs social recognition; that, through educational activities, society should testify that his work is worth while. To give special training to the two millions of people engaged in the professions and to provide no specific training for the thirty millions engaged in productive work in this country, has been to cast a slur upon manual labor. This lack of special education has practically pointed out to these workers that they were engaged in a life's work which was not worthy of being dignified by education. We have been assuming that while it was necessary to train in a technical college the man who designed the machine, it was not essential that the man who made it was in need of special training. The same has been true regarding professional training. To im-

ply that the doctor who cured the disease, brought on perhaps through poor sanitation, needed eight years of elementary schooling, eight years in high school and college, in addition to six years in a medical school and hospital, to fit him for his profession, and that the plumber, perhaps responsible for this unsanitary condition, needed but six years of elementary school work, devoid of all practical training as well as of all scientific facts relating to his trade, has been to place before the eye of the worker a wrong aspect of the value of his calling.

Genuine respect for labor.

We have talked much about the dignity of labor, meaning thereby manual labor, while at the same time we have so worked out our educational policy as if we regarded education as a matter of the head only. The result has been that a great many of our people, themselves the sons of men who worked with their hands, seem to think that they rise in the world if they get into a position where they do no hard manual work whatever; where their hands will grow soft and their working clothes will be kept clean. While there are some kinds of labor where the work must be purely mental, and there are other kinds of labor where, unfortunately, under existing conditions, very little demand indeed is made

upon the mind, it remains true that the bulk of the people should do work which makes demands upon both the body and the mind. To provide in our public schools for the trained mind in a trained body is to show that as a nation we have a true conception of the dignity and importance of labor. The calling of the agriculturist, the calling of the skilled mechanic, should alike be recognized as professions, just as emphatically as the callings of lawyer, of doctor and of clergyman. Our young people should be trained both in head and in hand and they should get over the idea—to quote Theodore Roosevelt—"that to earn twelve dollars a week and call it 'salary' is better than to earn twenty-five dollars a week and call it 'wages.'" Every parent wants his boy "to do better than he did and not work so hard." This is a laudable ambition and is typical of American life. But the parent often spoils the fine sentiment by his next statement, "My boy is never to work in the factory; as I have; he must get into a respectable calling."

Educational point of view.

In the entire process of education three species of emphasis may be distinguished. First, the personal emphasis, that which concerns the pupil alone. From this point of view, education is to be valued as develop-

ing and equipping the individual to make the most of life, to confer upon him self-command, to give intelligent understanding of the world of nature and of men and women. Second, the civic emphasis, which includes all that seeks to enable individuals to satisfy the rightful demands of the state, which insists that citizens be intelligent, moral and self-supporting and that they so develop the civic conscience that the state will be safe in their hands. Third, the vocational emphasis, that part of education that has to do consciously and exclusively with the individual's trade, calling or professional career. There is no intention of conveying the impression that these interests are to be treated by three distinct educational procedures, nor even that they are at any point completely separable, nor that one of these can be intelligently promoted without at the same time promoting the others; it is nevertheless true that at times we are regarding the welfare of the boy or girl; at other times we are thinking of the schools in relation to public welfare; at still other times we are chiefly concerned with training boys and girls for their careers. So without intending to relegate to the background any idea of personal culture or civic relations of these boys and girls, it is the purpose of this chapter to discuss vocational education more from the standpoint of the economic

welfare of the state, its industries and its workers, than from the point of view which concerns the pupil alone. Other portions of this book have dealt generously with those phases of vocational training which consider the personal needs of the young workers and at this time the economic phases of the subject deserve some special attention.

An economic consideration.

No nation is so blessed as ours as regards agriculture, commerce and manufactures. We lead the world in all except commerce; we are the wealthiest people in the world, partly for the reason that we have an abundance of natural resources and partly because we had as our early settlers men of great vigor and resourcefulness. All young nations having the great advantage of plenty of raw materials are enabled to advance rapidly in special directions. As a nation increases in wealth and productive ability its natural resources are reduced and more dependence has to be placed upon an economical use of its natural gifts. Especial attention must be paid to the best possible use of the means at hand. The older the nation, the more congested becomes the population of the cities and the greater becomes the question how the people shall live intelligently and support themselves.

The unprecedented growth of our population, its rapid concentration into towns and cities, the profound changes in our social and industrial conditions and the enormously increased facilities for intercourse with other nations have laid new duties upon the present generation. Politically, the Monroe Doctrine may hold good, but from the commercial standpoint it is a dead letter. We are participating in world-wide competition, and if the nation is to satisfy its ambitions, meet its required privileges, it must be equipped with every resource which education can supply.

Our foreign trade.

That we are not indifferent to foreign trade is evident from every trade and consular report; but, much as we desire to obtain it, we can never succeed except by exporting at low prices superior articles made by skilled workmen. We may attempt to hold our own markets by high tariff, but articles "made in Germany" will continue to be exhibited in our store windows. The "Yellow peril" is now confined to Japanese labor in California, but visiting commissions from Japan, studying our methods of manufacture and buying our machinery, foretell a commercial peril of even greater importance. The great international wars of the future will not be fought

with Dreadnaughts and air ships but with steam ships and intricate machinery. As a nation of producers, we must face the armies of skilled producers from abroad; we must match brain with brain and hand with hand.

Raw materials vs. finished products.

This is not saying that we have not already accomplished much in the way of supplying the markets of the world; but we are sending abroad too much raw material to be made into manufactured products while we buy great quantities of finished products made from our own raw material. We consume 75% of the things we make and we consume, besides, great quantities of things made in other countries. For example, to quote from address of S. P. Orth at the dedication of the Cleveland Technical High School, "In 1907 we exported $1,853,718,034 worth of products. Of this amount $513,054,836 or 28% was food stuffs, $593,145,135 or 32% was raw material for manufacture, $259,442,028 or 14% was partially manufactured material to be used in further manufacture, while only $480,681,423 or 26% was manufactured ready for consumption."

We are a great nation and need no reminder of the fact. But to be greater and wiser requires some study and forethought. While we have but 5% of the world's population we pro-

duce 25% of the world's gold, 33% of its coal, 38% of its silver, 40% of its iron, 42% of its steel, 52% of its petroleum, 55% of its copper, and between 70 and 75% of its cotton. Now there are three ways in which we can dispose of this wealth of natural resources. First, we can let other countries manufacture from our raw products and then we can buy the finished articles from them, paying the expense of the product's trip across the ocean, forward and back, as well as giving those countries a large bonus for manufacturing them for us. Second, we can import foreign mechanics, employ their skill in our mills, build up other mills for them, and enable them after a few years, to take the best industrial positions; in short to hand over our great industries to the foreign-born. Third, we can educate our own children to shape these materials into finished fabrics and to become sellers of those articles to the rest of the world instead of buyers. Obviously the third plan must appeal to every American citizen.

The raw product.

The statistics relating to our exports are deceitful to the lay reader who looks for dollar signs instead of studying the nature of the articles exported. It is no more to our credit to export such vast quantities of corn and cotton

and copper and crude oil than it is to the individual farmer to sell his fodder instead of feeding it. We would call the farmer a fool, who, in addition to selling his feed, also mined and sold the soil of his meadow. To the extent that we, as a nation, sell our raw products instead of utilizing them for our own industrial development, we are in the same class. This point is clearly brought out in the following table which shows the principal articles of importation into Germany from the United States, according to German statistics for the calendar year 1908:

Rank.	Articles.	Value.
1.	Raw cotton	$91,045,000
2.	Copper and manufactures	43,759,000
3.	Wheat	29,323,000
4.	Lard	22,675,000
5.	Mineral oils	18,480,000
6.	Hides and skins	9,910,000
7.	Wood and manufactures	9,452,000
8.	Oilcake	7,626,000
9.	Carbonate of lime	7,200,000
10.	Oleomargarine	4,635,000
11.	Turpentine	4,621,000
12.	Cottonseed oil	3,534,000
13.	Dried fruits	3,225,000
14.	Bran	3,158,000
15.	Mowing machines	3,060,000

In comparison with the above table it is interesting to note the nature of the principal articles of importation into the United States from Ger-

many according to United States statistics for the same year:

Rank.	Articles.	Value.
1.	Chemicals, drugs and dyes	$19,366,000
2.	Cotton and manufactures	18,037,000
3.	Paper and manufactures	7,817,000
4.	Silk and manufactures	7,411,000
5.	Toys	6,518,000
6.	Furs and manufactures	5,515,000
7.	Earthen, stone and china ware	5,287,000
8.	Iron, steel and manufactures	4,995,000
9.	Beet sugar	4,806,000
10.	Leather and manufactures	4,653,000
11.	Wool and manufactures	4,610,000
12.	Hides and skins	3,415,000
13.	Fertilizers	3,336,000
14.	India rubber and manufactures	3,166,000
15.	Wood and manufactures	2,606,000

Moreover, the increase between 1899 and 1909 in the trade between the United States and Germany is stated to be 80.8 per cent while the increase in value of exports from the United States to Germany is but 53.2 per cent.

The American spirit.

However, no one should gain the impression that our goods have no place; for American machinery, hardware, cutlery and other iron and steel products, in common with some other products, have an enormous sale in foreign lands, the point merely being that too many of our ex-

ports are raw materials. We have done much towards conquering the markets of the world and there must have been some basis for this accomplishment. In the main, it has been due to our cheap raw materials combined with the aid of the most ingenious labor-saving machinery and the rapid development of cheap transportation. We have taken all these advantages and coupled them together with a natural genius for industrial combination and coördination. We have understood better than any other people how to do things on a large scale, how to take advantage of the economics of combination. But the days of lavish waste are rapidly coming to an end. Soon we will no longer be able to fall back upon the virgin resources of an undefiled continent. The rapid growth of our population and its tendency cityward indicate that we are growing into an old country. In its wake, the vast procession of population must bring national conservation and personal frugality. As Frank A. Vanderlip of the National City Bank has put it, "Lavish supplies of raw material will not alone permanently command those markets. Ingenious labor-saving machinery can be duplicated. There are no international patent rights on efficient industrial organization."

The next step.

One of these days the whole nation will be led to see that in the haste of our marvelously successful industrial development we have lost sight of the fact that in the new industrial order which we have evolved we have left no place for a broad and adequate training for our industrial workers and unless we provide that training we will suddenly find our whole industrial structure standing on an insecure foundation. The system of machine production recognized as the American system of industry, is essentially of such a character that it cannot entirely meet the problem of providing adequate training for its workers. Such training then must be found outside of the industry itself. The next step in education is clearly in the direction of building up a great system of public trade schools. Whatever the development of such a system may cost, the failure to develop it will in the end be more costly. In the long run it must be true that the industry which will command the markets of the world, will be the one in which the workers combine with general intelligence the broadest technical knowledge and the widest technical skill. In the end, one of the great cornerstones of trade supremacy must be a body of industrial workers intelligently trained to accomplish with the greatest efficiency the desired results.

Factors in production.

An observant economist has indicated that the productivity of capital depends on five factors: first, on scientific mastery of the laws of natural forces and materials; second, on the invention and use of the most perfect tools, machines and technical processes; third, on the perfection of the organization and discipline of the factory, mill or shop; fourth, on the selection of raw materials and arrangement of the plan of manufacture; fifth, on the health, energy, intelligence and hearty coöperation of the workmen.

This last factor—the most important of all—has been too much neglected in our country.

When the manufacturer needs a leader or a particularly skilful workman for some new line of effort he finds that he can turn only to a band of specialized workmen who have been trained to one thing and never have had any experience at anything else. He cannot find this skill unless he happens to possess an exceptional man who has learned other operations in spite of the difficulties that have prevented the ordinary man from getting out of his rut. Obviously the manufacturer is just as much at a disadvantage from the present system as the worker himself. Germany did not awaken to its industrial opportunities until after the Franco-Prussian war, and at

that time England and America had advanced a long way. The German mind, however, saw the inherent weakness of the industrial system of the English speaking people, and by establishing a complete system of industrial training, was able to march toward the front in the industrial world until it has taken practically all of the South American trade from England and this country.

Adaptability of labor.

It becomes after all merely a question as to whether the worker has the requisite adaptability to adjust himself to new industrial conditions. One hardly needs to recall past industrial changes which have so modified old processes of manufacture that there was an immediate call for workers who had the requisite manual adaptability and intelligence to keep pace with the growth of industrialism. We cannot change the position of the machinist, because the laws of business organization compel specialization. But the machinist can be so fitted for his occupation, that when the exigencies of the shop demand the finding of a new foreman, his mind is already awakened to the principles of the business far beyond the routine of the single operation to which he may have devoted all his manual labor while in the shop.

A proper trade training would incite the

worker to keep in touch with all the phases of related work so that when the time comes for advancement he can be one of the candidates for the higher position. This is meant to apply to the average boy, for there are a few who are always so alive to their opportunities that, with education or not, they are bound to push to the front on their own initiative. Even the average man, however, should thus have a better chance —not a certainty, but a chance to get out of the rut and into the road of promotion. As Mark Twain once said, "Training is everything. The peach was once a bitter almond; cauliflower is nothing but cabbage with a college education."

An imaginary difficulty.

While we can do nothing better than to analyze the problem of trade schools, we can do nothing worse than to stop with our analysis. Someone will raise the question, "But if we train every boy to learn a trade and to have adaptability, who will do the ordinary manual labor?" In other words, some express the fear that there is an economic danger in educating mechanics, not only because they will force other men out of employment but also because the laboring man and woman will be far too good for laborer's work. Such a point of view is too academic for

it must be remembered that science is steadily sweeping away all the humbler classes of employment. Few men have now to toil up ladders with the hod of bricks upon their shoulders. The donkey engine does the purely animal part of the work. The reaper is replaced by the machine and the plowman is rapidly receding as the steam plow makes its appearance. Outside of eastern countries, we rarely see long lines of men, laden with coal bags, running up planks as in the olden days in our ports. Just imagine, if ships had still to be moved by galley rowers, what millions would be doomed to beastlike toil. Of course some parts of the domain of unreflective labor will long be left untouched, but the process is going forward. It is clear that while education is rendering the toilers dissatisfied with the humblest sorts of occupations, science is steadily sweeping away these occupations. It is clear that it has by no means conquered the whole domain. There is still much scrubbing of floors done by men and women on bended knees; and coal is still hewn out with pick and ax and the use of muscle, with but little use of brains. Science never works by revolution, but by progression. If we give to science a reasonable time it should leave us little of that labor which is not coupled with mental effort.

Evolution of employments.

If science is abolishing occupations at the lower end of the scale, it is creating new ones at the top. Think of the hundreds of thousands of men in America who are now employed in callings that had no existence sixty years ago: the telegraphers, linotypers, electricians, chauffeurs, and workers of a hundred kinds. In the last decade or two, an army of skilled men have been demanded by the invention of the bicycle, the telephone, the electric light and the automobile. These entirely new employments strike the mind most forcibly, and anyone who runs his eye down a city directory showing the occupations of the people will satisfy himself that in America of the present day at least one-fifth part of the adult male population find their livelihood in callings that had no existence a generation ago. While science takes away with one hand, it liberally bestows with the other; but what it takes away are the low class occupations, and what it gives are the high class ones demanding intelligence and cultivation. The general tendency is, therefore, humanizing. The history of the textile industry in New England will serve to remind us that many of those who perform the more monotonous parts of manufacturing work are, as a rule, not skilled workers who have come down to it from a higher class of work, but unskilled workers

who have risen to it. For example, a great number of those who formerly worked in the Lowell cotton mills had come there from poverty-stricken districts of Ireland. These people have left the mills and gone into stores and offices. Later the mills had large numbers of French Canadians. They left for other occupations. Then came the Greeks. They are now leaving for the shoe factories or are becoming small retailers of confectionery in large cities. At the present time these mills have Poles who have come from the most miserable conditions of life in the poorest agricultural districts where they were fed and housed more inadequately than the animals which they tended. Of course while there is a gradual creeping up in the scale of occupations, it never happens that the coal-heaver, when thrown out of work by the introduction of a steam crane, can go away and get a place in one of the newly created superior callings. He is not such a fool as to waste his time in applying for an opening as an electrical engineer. This transfer is effected by the promotion of individuals, but in a higher degree it is brought to pass by promotion of generations, for it frequently happens that the plumber educates his son to be an electrical engineer, and the teamster apprentices his boy to the plumber, and the dock laborer sees his young son aspiring to be a chauffeur.

What constitutes skill.

The right of every boy to have an opportunity of learning a skilled trade is complicated by the difficulty of defining just what the word "skill" means; for the modern method of production has modified the ordinary conception of what constitutes skill. Undoubtedly the numerous gradations of skill resulting from the extensive use of machinery and subdivisions of labor render it extremely difficult to classify laborers into noncompetitive groups, each upon a different plane from the others. Under modern conditions, skill implies not only manual dexterity, but speed and accuracy. It is measured not only by the quality of the product, but also by the quantity of the product. While there is a certain degree of intelligence required in the commonest kind of labor, nevertheless, in the sense in which the terms "skilled" and "unskilled" are used, unskilled labor is generally understood as that labor which does not require experience in order to give satisfaction to the employer. Skilled labor is that which requires sufficient experience and training on the part of the worker to do it both efficiently and speedily. In this connection, Prof. Giddings offers the following classification of labor: first, automatic manual labor, including common laborers and machine attendants; second, responsible manual labor, including those

who can be trusted with some responsibility and some degree of self-direction; third, brain workers, such as bookkeepers; fourth, responsible brain workers, including superintendents and directors.

A broad division.

The United States Department of Commerce and Labor, in a bulletin published in 1906 on "Condition of Entrance to the Trades," roughly divided industrial workers into two classes. The first class includes those who, from their natural ability or training, have become proficient in all branches of a trade or craft; who are not only able to do the finer kinds of work, but because of their training and skill, are also able to perform their work intelligently without the constant supervision and direction of others. These men receive relatively higher wages in all countries, and by their skill are enabled to adjust accurately their tools to the machinery and manipulate them so that the work may be turned out with accuracy and rapidly. The second category comprises the bulk of the unskilled workers; men who have not the ability or who are not sufficiently trained to become skilful mechanics. These men have not the knowledge or ability to intelligently perform all the processes of a trade, but when given a simple service to perform, or when placed in charge of a machine to which the material is

adjusted, they are able to turn out accurate work, and one of them, in some cases, may take charge of several machines. If a man of this class is intelligent and is rapid as well as accurate in his movements, he may in time acquire a skill which may increase his earnings to or even over that of the trained mechanic.

With specialization of machinery has come the specialization of the man. While the effect of new processes and machinery in modern industry has been to enhance quantitative skill, it has at the same time decreased the relative importance of qualitative skill. Quantitative skill implies close application and the possibility of the worker enduring intense nervous strain. Qualitative skill, which we more generally recognize in the skilled worker, implies both manual dexterity and a thorough knowledge of the trade. When a boy starts to work in a factory he can be made a more profitable unit if his attention is centered upon one occupation, and whenever one sees this law of production operating he may well think of trade schools and the outlook for the boy. The boy is put at some task, and the more expert he becomes the less likely is he to be shifted to anything else. This is a serious matter, and the chapter on "schools in the factory" points to one solution. The other lies in public trade schools.

Job or vocation.

Some one has said, "Germany trains its youth for a vocation; the United States trains its youth for a job." Gradually it is being recognized that the responsibilities of the state in educating the people demand not a conventional education, but one that is modified as far as possible to meet the needs of individual boys and girls and to fit them for that work in life to which they seem destined by inclination or qualities. We cannot actually plan for each individual child, but we can come as near that as the conditions will permit. This we have failed to do in the past when the educators seem to have been governed entirely by the college requirements regardless of the fact that not every child can be a lawyer, a doctor, a clergyman or a business man of high rank. If a boy's native talents best qualify him to become a blacksmith, let us make him the best blacksmith that we can. If a boy will make a first rate carpenter and be first rate at nothing else, why should we try to force him into that something else? He should be shaped in the way of his aptitude from the beginning. In this way every boy will have the best chance, for his maximum development depends upon the discovery of his aptitudes. He must be developed as an individual, not as a mere particle in a mass. It is only by the emphasis upon the in-

dividual that the state can produce worthy men and noble women. When we run the children through a pedagogical grist-mill, treating them as though there were no individual differences, we get a generalized product, like the miller who bolts his kernels of corn and turns them into a homogeneous mass with their individualism gone and their power of germination and growth destroyed.

The public trade school.

Having taken up the economic need for trade schools, and the impossibility, in the majority of instances, of an adequate training for the young wage-earner in the shop itself owing to the modern system of production, it is proper at this point to consider the distinct methods of these schools, their advantages and some of the results they may be expected to accomplish. *A trade school proper affords the means of an enlightened apprenticeship in that it aims to give such an ideal preparation for the trades as shall abolish the drudgery and waste of the learner's time in the shop, by supplying in the school an economic instruction in the practical work and in the necessary theory of the trade.* The best type of trade school has not only shops where the expert manipulation of tools is taught but also classrooms where instruction in the theory which un-

lerlies the trade is given. The question is often .sked, "Can a school teach a trade?" In general, ıo trade can be learned entirely within the walls ıf the school. In general, no trade can nowadays ıe learned entirely within the walls of the factory. t is a combination of these two opportunities vhich will make our workers more efficient.

School vs. shop.

In view of what has been stated in this and ıther chapters regarding the status of apprenıiceship and the specialization of manufacturing nethods, it is worth while at this point to consider ome of the reasons why a trade school can ender a better service than the average shop in leveloping skilled mechanics.

The school helps to make a profitable workman n a shorter time by giving him legitimate shop ıractice in the work of the trade under instruc-ion. Definite practice in the work of the trade rom the very beginning in ıool is a far dif-erent proposition from sweepir g, piling castings ır running errands for several weeks or months n the shop, as is usually the case with the be-ginner.

The school gives a series of graded lessons, general and fundamental, upon which other work may be based and future efficiency more certainly leveloped. The lack of sequence in the ordinary

shop work makes his labor mere routine for the average boy.

The school provides the opportunity to do a task over and over again until it is done right; the opportunity to study each problem closely and deliberately. In a shop there is little chance to try again. The work must be thrown away. A sharp reprimand from the foreman, unaccompanied by suggestions, can never take the place of definite instruction.

The school presents a broader, more intelligent idea of the relation of the parts to the whole. The beginner learns the dependence of one part on another. The tendency to keep a cheap grade of laborers doing one thing may make tolerably good machine tenders, but if we expect our bright boys to respond to unusual problems, they must practice all the usual operations of production.

In the school the instruction is direct and personal, given by one who is selected, not only because of his superior qualities as a workman, but because of his ability to teach. The instruction in the average shop is haphazard and accidental, given by a foreman who is already harassed by a multiplicity of details. It must be said, however, that the school will come nearer to taking the place of the shop, only as it approaches the commercial standard of the shops. The incentive of the commercial demands of the shop will

emphasize the value of time. A clear conception of how a piece of work should be done is necessary at the outset to avoid a waste of time.

Distinct field.

These trade schools ought to be sharply distinguished from technical schools and from manual-training schools. They should have a distinct individuality and a definite object of their own. They should contain nothing that naturally looks away from the shops. To quote Commissioner Andrew S. Draper, "They are primarily, neither to quicken mentality nor to develop culture: those two things will come in the regular order. The 'culturists' are not to appropriate these new schools. They are not to train mechanical or electrical engineers. The literary and technical schools are doing that very amply. They are not even to develop foremen; leaders will develop themselves for they will forge ahead of their fellows by reason of their own ability, assiduity, and force."

With such a definite object in view it should not be difficult to lay down some fundamental principles which will operate in establishing these schools. In brief they are, as follows: pupils enter the trade schools with a definite purpose of preparing for industrial careers; the trade school absolutely abandons all college prepara-

tory work; there is almost no instruction in pure mathematics or pure science, but, instead, a fair amount of time is given to such applied mathematics and applied science as is closely related to the trade selected by the pupils—in fact, all the instruction, whether in classroom, shop or laboratory, is designed so as to be directly usable; the trade schools will necessarily take on varying forms in different localities; they will not be parallel to existing high schools in that they will not necessarily draw pupils who have completed the eight grades of the elementary school; they will have a more or less direct connection with the intermediate industrial or vocational schools outlined in another chapter; those students in the trade schools who have had preliminary industrial training in the vocational schools should be allowed to take highly specialized courses in the trade schools concentrating upon the development of skill and practical knowledge. (See diagram on page 177.)

Requirements for admission.

If a trade school is to reach the largest numbers and do the most effective service, its problem is not primarily that of the high school, for it ought to be clear that boys who enter mechanical trades, leave the public schools almost without exception before graduating from the gram-

mar grades. Consequently, the beginnings of trade education, if such education is to articulate with our present school system, must be had in schools that will draw their pupils largely if not entirely, from the class of boys who have not graduated from our present elementary schools. Such education, therefore, cannot be parallel with existing high schools. In order to prevent possible misunderstanding by pupils or the public, such schools should be frankly recognized as independent in their requirements for admission. The closer they follow this procedure the nearer they will come within the economic possibilities of boys and girls who follow manufacturing trades. That a trade school cannot have the academic requirements of our present high school is evident from the statement of an Albany, New York, manufacturer: "I have made inquiry of over 100 workmen in my employ, machinists largely, hence representing a trade of intelligence higher than the average. The inquiry developed two facts. First, out of 102 men there was not to be found a single graduate of a high school nor a person who ever attended as a pupil in a high school course. Second, out of 102 men I found only 7 who had completed the course in the grammar schools. From this it appears that the education of all of these mechanics was limited to such instruction as is furnished by the gram-

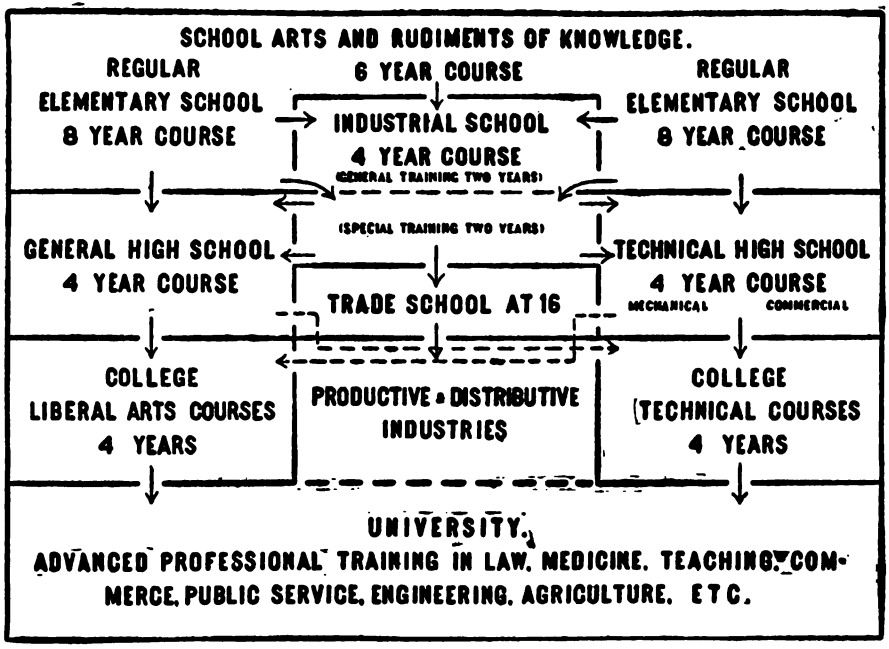
Relation of Intermediate Industrial to Other Schools.

The relation of the intermediate industrial to other schools is important. It is clear that there need be no "blind alleys" in a comprehensive scheme of industrial education. Neither industrial nor trade schools make for class distinction or class education. They simply provide an educational opportunity as purposeful and definite for those who work in our constructive industries, as is now provided for entrance to the professions. The former school is expected to fit for the trade school or for the industrial courses in high schools. A graduate of this school may enter the advanced courses in the technical high school.

The courses of study in the industrial schools will be from two to four years in length, because this length of time is necessary to produce the requisite training for a life of progression in industrial efficiency. The trade schools will be open to pupils who are sixteen years of age, and will fit directly for the productive and distributive industries. While the trade schools will not fit for the technical college, there is no reason to believe that a bright boy could not enter a technical college from a trade school if the college would but recognize the training which the school gives.

While allowing a reasonable interchange of students from one school to another as they find their interests in their probable future employments changing, care should be exercised that industrial education has a distinct field of its own.

RELATION OF THE INDUSTRIAL TO OTHER SCHOOLS.



mar schools and that 93 per cent of them belong to the class of pupils that drop out of school before completing the grammar school course."

This point is well illustrated by the story of a boy in a western city who thought that if he remained in school he would be educated away from working with his hands. He had been kept in school and prevented from playing truant by the efforts of a city judge. Having reached the age of fourteen he left school and after a lapse of some months was accosted in the street by the judge, who said: "John, why have you left school?" He answered that he was working for a plumber. The judge then said: "Why did you not remain in school and finish the course and get an education?" The boy unconsciously discovered and stated the deficiency of the school system in which he had been a student, when he answered: "Why, Judge, if I keep on going to school and get an education, how can I get to be a plumber's helper?"

Manual training vs. trade training.

Naturally the question arises as to the relationship between manual training and trade training. The existing manual training courses in the high schools are not trade courses, neither the manual nor the academic instruction being especially planned to be of direct vocational service. Their

pupils are of the same general type, of the same age and of the same preparatory training as are the pupils of the classical courses. Their courses endeavor to develop the same type of intelligence, the same habits of thought and the same kinds of ability as do the other courses in the high schools. They are located in schools of the college preparatory type in which the instruction, mechanical as well as academic, aims to provide the mental discipline of the kind required of those who would continue their studies in higher institutions. In filling this function, these schools are serving a useful purpose in that they offer a large variety of means by which pupils who are capable of a higher study can get intellectual training and preparation for higher institutions, through subjects which are congenial and adapted to their tastes.

Recently a new type of secondary school, called the technical high school, has originated, having for its distinct purpose the preparation of its pupils for industrial leadership—that is, for positions in industrial life requiring skill and technical knowledge and of greater importance and responsibility than those of the skilled mechanics. In such a school the instruction deals not only with the important manual operations, but also with those principles of science and mathematics and their direct application to in-

dustrial work which will help the student to master the more intricate processes and problems of the industries which are taught in the school. This type of school approaches more closely the trade school than the manual training high school, but is not to be confused with it. At the risk of repetition, it must be said that the trade schools have for their definite purpose the preparing of boys or girls for skilled mechanical trades and that they deal with their pupils during a briefer course and allow practical work earlier than the technical high school. The trade school places its greatest emphasis upon practical handwork instruction and makes the conditions concerning this part of its work resemble those in the actual trade as closely as possible; and it also relates its academic instruction at every point closely to the practical work, including little which will not be afterwards directly usable in trade work. No note of disparagement of the work of the advanced technical schools or the manual training high schools is intended. The higher technical schools are of the highest advantage and they might well be multiplied. The same may be said of the manual training schools of high school grade, but it should be known that they are essentially college preparatory schools, or schools of general culture and that they do little in the way of training work-

men. The state now stands in need of training in craftsmanship. This is a land of educational opportunity and of free choice of work. The public has had the habit of providing schools which lead to professional, more than to industrial employments. This is a discrimination which is unjust to many of our people and it is clearly a disadvantage to the community.

An academic objection.

The question is often raised whether, if a system of trade schools is to train for individual occupations, there is any normal limit to the number of such schools that will be needed in any given locality, seeing that there are over 300 recognized occupations in this country. The question is largely academic; for an analysis of various industries will show that the processes of production may be classed roughly under two heads: first, the constructive trades in which the work is essentially individual and quite independent of machines, especially those that are automatic, as, for example, plumbing, patternmaking, printing, cabinetmaking, tool making, lithography, die making, etc.; and second, manufacturing industries in which there are many employees who work with much machinery, where workmen act in coöperation, where each is a part of an organization, as, for example, in such

highly specialized industries as shoes, textiles, knitting and clothing. In the first division the schools may train mechanics who work independently, mainly with their own tools and without machinery. In the other, the schools must train, as far as it is possible, all-around workmen.

In cities not large enough to maintain a number of special monotechnic school units it may be possible to have two types of trade schools by considering the constructive trades as roughly divided into two main classes: first, the building trades—i. e., carpentry, masonry, plumbing and pipe fitting, and such fundamental trades as are concerned in the erection of buildings; and second, the mechanical trades—i. e., pattern making, forging, cabinet making, the several forms of machine shop production, and all such other lines of shop work as involve the use of machine and hand tools.

The Williamson School of Trades.

A brief description of at least one trade school ought to be given. For the purpose the Williamson School of Trades has been chosen. To be sure, it is a private school, generously endowed and operated under unusual conditions—in fact it is almost a "trade-college," but its record of twenty years makes it well worth describing. At its seventeenth annual commencement in 1910 it

graduated 51 boys out of 70 who entered the class three years ago. These boys were divided among five trades: 14 carpenters, 12 bricklayers, 11 machinists, 10 patternmakers and 4 stationary engineers. In 1910 Director Bitting writes: "We graduated 51 and before noon of commencement day could have placed 160 without any effort on our part at all; since then we might have placed at least 50 more, making a total call of about 200 to 225 for 51 men. Since their graduation I have heard directly by letter from 33 of the 51, and all report a very successful start in the industrial world; the rate of compensation varying from ten to thirty dollars per week. The majority of our students start with wages ranging from twelve to sixteen dollars per week. The calls for them come from many sections of the country and the boys are pretty well scattered." The school has turned out 777 boys trained in these five trades. The record of the last five classes is as follows: Bricklayers, 62; carpenters, 59; stationary engineers, 31; machinists, 62; patternmakers, 54—total 268. They are engaged in the following pursuits: at mechanical trades as journeymen, foremen, superintendents and contractors, 244; at college, 5; at commercial pursuits, 15; no information, 2—total 266. Four of those at college worked for considerable time after graduating, at their trades, and the two who died

were doing the same. The average wages per day received by these graduates are as follows: bricklayers, $4.64; carpenters, $3.84; stationary engineers, $3.60; machinists, $3.28; pattern-makers, $3.10—the first two being for eight hour day and the last three for 10 hour day."

To be sure, Williamson has its own advantages, not shared or likely to be shared, by most other schools of similar intent. It has what to most schools would have been a misfortune, an endowment of $2,500,000. It has a board of trustees composed of business men forming a close corporation. It has a site in the country consisting of 230 acres of land. It has its boys on the school premises all the time. It selects each year an entering class of about 75 boys from a waiting list of 400. Naturally, these boys are a picked lot, for pupils have everything to do with the success of this or any other school. They are healthy looking boys, full of life and fun, but appreciate that their working time is for work. They have to choose their trade before they enter and consequently the school loses but a small part of its number during the course; 70 to 75 per cent of the boys who enter stay and are graduated. Of course part of this is due to the unusual conditions of free board, room and clothing, which can hardly prevail in public school work. The shops and academic portion of the

school are in session eight hours daily on five days of the week, and three hours on Saturday, each apprentice spending about one-half of the time in the shops during the first year, the proportion gradually increasing until the last three months of the last year, when it includes the entire day. The branches taught in the academic department are reading, writing, grammar, arithmetic, algebra, geometry, trigonometry, physical and political geography, U. S. history, English literature, physical science, physiology and hygiene, civil government, chemistry, elementary vocal music, theory of the steam engine, strength of materials, building construction, and mechanical and freehand drawing. The instruction in drawing pertains directly to the apprentice's particular trade. The mechanical courses are systematic and the exercises are very comprehensive and thorough, and are based on instructional methods. The school is not a factory and nothing is made for sale, its sole object being the improvement of its apprentices. The managers believe this plan to be better than if they worked on commercial lines, for in that case they would be obliged to subordinate their instruction in a considerable degree to the financial gain. Nevertheless, it must not be assumed that the shop work is not practical. For example, the boys, as a part of their building trade course, have

built a shop 60 by 120 feet, four stories high; a double cottage accommodating 30 or 40 people; a barn, a pump house, and so on. In fact, for many years they have done all the necessary building work themselves. Naturally the expense has been simply the cost of material plus the cost of such work on the building as comes under trades other than those taught in the school. Of course the boys in the first year do not work on permanent structures. They work in the basement of the shop on plain 4-, 8-, and 12-inch walls with returns and partition walls, plain arches and simple corbels. The work is torn down and rebuilt as often as necessary so that the boy may have abundant practice. During the second and third years the boys proceed to actual construction where poor work is torn out and done over again at once and where the boys realize that it is to stand for years a monument to their ability.

The objector answered.

Someone has said, "The most remarkable thing about trade schools in America is their absence." Every sort of objection has been raised against them. The combination of social, educational and economic difficulties has been too great for the few private trade schools that have started. Schools in common with other ventures

are likely to move along the line of least resistance. For this reason, several schools that were planned by their donors to be trade schools have proved unfaithful to the trust imposed upon them. But gradually the trade school movement is making headway.

Robert A. Woods, head worker of the South End house in Boston, outlines the advantages of trade schools from his observation as a social worker: "When our working people understand that this further development of education comes in precisely where they themselves feel the need of training; when they see that the taking of the younger children out of the labor market will raise the wage for all the older members of the family; when they understand that the higher degree of technical skill got under the most favorable conditions will mean for the boy or girl the capacity to earn within a short time a surplus sufficient to cover the additional school period; that he will be established for life upon an ascending wage standard; that he will be assured permanently of much more steady employment and will have a distinctly longer working life—then we shall see the very large majority, even of the poorer families, contriving to do their utmost to give their children so precious an opportunity." In the final analysis we can

safely trust to the wisdom of the people. We can do no better service than to educate the public conscience to the point where it will see through practical examples the value of trade schools.

VI

TRADE UNIONS AND TRADE SCHOOLS

ORGANIZED labor has always concerned itself with the welfare of the industrial workers of the country. It has agitated the questions of a higher living wage, better factory conditions, and proper restrictions of child labor. In the latter connection it has always supported any legislation which would increase the number of years that boys and girls should stay in school. Now more effective education and the raising of the age limit of school attendance are intimately associated; so it is not surprising to find trade unions observing keenly a movement which assists in keeping children at school by a direct appeal to the child's needs and interests, the establishment of sound and thorough industrial education.

Education and labor.

Labor leaders are aware that it is not wise for boys to leave school before reaching the age of business efficiency, and believe that rational industrial training between the ages of fourteen

and sixteen ought to awaken in them a new school interest as well as prepare them to enter some branch of the industrial world; for organized labor maintains that as much attention should be paid to the education of those who are to work in our industries as is now given to those who are to enter the time-honored professions.

At present, the methods of our schools are too closely related to educational tradition; and the mass of our school children has been, and is, actually trained away from a proper attitude toward manual work and from a sympathy with those who must work with their hands. A 1910 report of the American Federation of Labor relating to this subject states, "Owing to past methods and influences, false views and notions possess the minds of too many of our youths, which cause them to shun work at the trades and to seek the office or store as much more genteel and fitting. This silly notion has been shaken by the healthy influence of unions and will be entirely eradicated if industrial training becomes a part of our school system. In consequence of this system the youth will advance greatly in general intelligence as well as in technical skill and in mental and moral worth. He will be a better citizen and a better man, and will be more valuable to society and to the country."

Danger of specialization.

Now the trend of industrial development is constantly along the line of specialization. Modern manufacture dispenses with the all-around worker. Theoretically, at least, the workers who do but one task over and over again in place of the hundred different operations originally performed by every worker, ought to reach a high level of efficiency by the mere repetition of the process. Yet this is by no means certain. "It must be recognized," states Samuel Gompers, President of the American Federation of Labor, "that specialists in industry are vastly different from specialists in the professions. In the professions specialists develop from the knowledge of all the elements of the science of the profession. Specialists in industry are those who know but one part of a trade and absolutely nothing of any other part of it. In the professions specialists are possessed of all the learning of their art; in industry the specialists are denied the opportunity of learning the commonest elementary rudiments of industry other than the same infinitesimal part performed by them perhaps thousands of times over each day." Industrial training, therefore, to be successful, must not make the mistake of attempting to turn out specialists in any one branch. Its work will be to

develop a general working intelligence rather than the special skill needed for the single feature of a complicated process, the performance of which will have to be learned in the factory itself.

Public or private control.

Undoubtedly if the trade school movement in America is to make appreciable headway it must have the sympathy and aid of the labor organizations. This is perhaps the strongest reason for urging that these schools become a part of the public school system. If the community does not interest itself in public industrial training, but leaves it to be carried on by private enterprise, there is danger of selfish exploitation of the workman by the manufacturing concerns, with the result of a narrow, specialized training of the student for the benefit of the individual employer. It is no wonder that private trades schools have excited prejudice and even hostility, for unions will never widely accept schools which they think are created and operated in the interest of the employer and not of the employee. They will not sanction what can be used in favor of another, and often opposed interest, thus arrayed against their own.

A way must therefore be found involving public ownership of these schools, that they may be managed for the benefit of all the people, or at

least of all who may have common interests in any trade. In nearly every town where there has been general agitation of the subject of industrial education, organized labor has expressed the sentiment that such schools should be administered by existing educational bodies—advising, however, that these should have the assistance and coöperation of persons engaged in the trades and industries and every school to have its local advisory board appointed by the proper school authorities. With the counsel and advice of such a board, labor believes that in the schools a just balance can be maintained between the interests of employer and employee, capital and labor uniting in a plan for developing efficiency of the workman, educating him socially and industrially.

Place of the graduate.

Trade schools are professional schools for those who are to become workmen. Labor leaders often speak of their apprehension in regard to the schools' turning out finished craftsmen, sometimes going so far as to call them "scab hatcheries." But the trade schools cannot expect to graduate "finished" craftsmen any more than the law and medical or business schools can expect to send out finished lawyers, physicians, or managers and superintendents. The time is

not far distant, however, when the finished craftsman will be as dependent on the technical and trade schools for his education in his calling as the lawyers and doctors are on the professional schools to-day. Compare the purpose of the state normal school with that of the trade school: For years the state normal school has been giving vocational training to those who plan to become teachers. It is the combination of normal training and actual teaching that makes efficient teachers. Yet no one will affirm that a recent graduate is the equal of a teacher of experience. Nor will the graduate of a trade school be able to take the place of a finished journeyman. While it is practically impossible to acquire an all-around training in the shop or factory, it is equally true that no trade can be learned entirely within the walls of a school. The trade school, however, which has a shop where expert manipulation of tools is taught, and a class room in which is given the theoretical instruction underlying a trade, will form a good foundation on which to build individual advancement when the worker enters the shop. This preparation for individual efficiency can scarcely be said to menace any legitimate or existent interest of organized labor.

Time of entrance into trades.

It is undoubtedly true that the trade school will shorten the period of apprenticeship in the factory. Industrial training, however, does not presuppose an earlier entrance to industry than at present, nor that such training will displace any of the necessary and fundamental studies now taught in our schools. Under no circumstances will organized labor endorse a substitution of industrial training for the ordinary school arts, such as reading, writing, spelling, drawing, arithmetic; nor emphasizing it before the rudiments of history, geography and nature study are fairly completed. The report of the American Federation previously referred to anent this subject states, "Our movement in advocating industrial education protests most emphatically against the elimination from our public school system of any line of learning now taught. Education technically or industrially must be supplementary to and in connection with our modern school system. That for which our movement stands will tend to make better workers of our future citizens, better citizens of our future workers." That is, it is imperative that every child shall have the elements of a common school education; however long it may be necessary to prolong the school period to attain it, he must be able to read

understandingly, to write legibly, and use figures intelligently if only for his own protection, to prevent others from over-reaching him. If he is to hold his own in our modern civilization he must also receive instruction in certain principles of ethics and economics which have a direct bearing on social and industrial life. No study which contributes to his future usefulness as a citizen or develops the better side of his nature, can be neglected or replaced by vocational training.

Those educators who feel a deep concern regarding the danger of vocational training lowering the standard of present education need have little fear of such an outcome, for they are not the only sponsors of sound education. Whenever I have appeared before a body of trade unionists I have been impressed with the earnestness with which these men discussed the problems of education. Oftentimes I have found that they can be trusted even more than bodies of educators to guard the educational interests of our boys and girls. In these meetings there is never a note sounded which might be interpreted as being an argument for class distinctions in educational policy. It is the ambition of every working man that his child have a better chance than he had. The only pathetic incident is that sometimes

these men feel that the chance is apart from any work with the hands.

A heavy responsibility rests on industrial teaching. To command respect, it must be in the hands of real artisans and not of theorists who are indifferent mechanics. Whatever is done will have to be done thoroughly. Labor will tolerate no false pretense in regard to mechanical skill. These schools must minimize talking and magnify doing. At the same time, to be of greatest service to both individual and community, they must not only prepare the student for actual work, but continue the cultivation of mind and spirit begun in the earlier years of school.

At a legislative hearing in Boston, an academic discussion had been in progress for several hours, relating to supposed difficulties in starting trade schools. The questions as to whether these schools would lower wages and how many years of apprenticeship would be deducted by attendance upon them were discussed. In common with others present, I was startled by a sudden outburst from a labor leader when he said, "Give us the schools, let the boys have this trade education, and we labor men will look after the spoils." Certainly there was food for thought in his remark, for no amount of discussion by professional educators can determine these points. After all,

the main question is to have the right sort of industrial education, leaving the "spoils" of increased wages and shortened apprenticeship to be adjusted by capital and labor.

Supplemental training.

We have been discussing the trade school for the young student. There is another class that demands attention—those already engaged in the trades, who are desirous of promotion and feel the impossibility of advance without the definite training such as a school can give. It is to be taken for granted that organized labor will lend its support to any plan of public industrial education which will emphasize the training of those already engaged in the trades. It has, indeed, urged that industrial schools should be open evenings for those who cannot attend during the day. Evening instruction is necessarily supplemental in its character and should be limited to those who can gain a direct benefit from it. For example, it is obviously unfair to hold out alluring inducements to a store clerk that he may become a plumber if he attends a night school. Practical trade experience in the daytime supplemented by evening schools in which is taught a considerable amount of theory, of scientific principles underlying the trade, with some practical shop work, is the only sane pro-

cedure. In general, these industrial and trade schools should be flexible enough to provide, first, for those who can attend school all day; second, for those who must work a part of the time in order to earn a living, but can afford to go to school for a short session; and third, for those who must work all day, but wish to attend school at night.

Labor's first step.

At several conventions of the American Federation of Labor there have been discussions of the varied topics of industrial education. At the Denver meeting in 1908 the following resolutions were adopted:

"Whereas, industrial education is necessary and inevitable for the progress of an industrial people; and

"Whereas, there are two groups with opposite methods and seeking antagonistic ends, now advocating industrial education in the United States; and

"Whereas, one of these groups is largely composed of the non-union employers of the country who advance industrial education as a special privilege under conditions that educate the student or apprentice to non-union sympathies and prepare him as a skilled worker for scab labor and strike-breaking purposes, thus using the chil-

dren of the workers against the interests of their organized fathers and brothers in the various crafts; and

"Whereas this group also favors the training of the student or apprentice for skill in only one industrial process, thus making the graduate a skilled worker in only a very limited sense and rendering him entirely helpless if lack of employment comes in his single subdivision of a craft; and

"Whereas the other group is composed of great educators, enlightened representatives of organized labor and persons engaged in genuine social service, who advocate industrial education as a common right, to be open to all children on equal terms, to be provided by general taxation and kept under the control of the whole people with a method or system of education that will make the apprentice or graduate a skilled craftsman in all the branches of his trade; and

"Whereas organized labor has the largest personal and the highest public interest in the subject of industrial education and should enlist its ablest and best men in behalf of the best system under conditions that will promote the interests of the workers and the general welfare, now therefore, be it

"RESOLVED, that the President, in conjunction with the Executive Council of the American Federation of Labor, be and is hereby author-

ized to appoint a special committee of at least 15, to be composed of a majority of trade union members of this convention, who will serve without compensation and incur no expenses other than necessary and legitimate expenditure within the judgment of the president and executive council to investigate the methods and means of industrial education in this country and abroad and to report its findings, conclusions and recommendations to the next annual meeting of the American Federation of Labor."

A definite program.

In order to bring out practical suggestions toward a solution of the problem the special committee of fifteen addressed themselves to the following questions:

1. Should trade, vocational, technical and industrial schools be established as a part of the public school system?

2. Should private industrial educational institutions be tolerated?

3. Under what conditions and terms should industrial schools, either public or private, be countenanced and supported?

4. Under what conditions should semi-private or semi-public industrial schools—namely, the so-called "coöperative industrial schools," be approved or disapproved?

5. Should they be free, supported by the city, county or state in which they are located?

6. Should they be under the control or partial control of the national government?

7. And should their instructors or teachers be practical men from the ranks of trade occupations or should they be men who know nothing of the trade itself except its theoretical side?

8. What should be taught under the head of "industrial education"—the cultural side, the professional side, the mechanical side, or all combined?

9. To what extent, if any, should labor headquarters, labor temples and labor halls be used to favor industrial education?

Report of 1909 *Committee.*

Invitations were extended to leading educators, business men and publicists to appear before this committee and as a result a report was made to the Toronto Convention of 1909. An abstract of the conclusions of the committee follows:

"If the American workman is to maintain the high standard of efficiency the boys and girls of the country must have an opportunity to acquire educated hands and brains such as may enable them to earn a living in a self-selected vocation and acquire an intelligent understanding of the duties of good citizenship.

"There is a strong reaction coming in general methods of education, and that growing feeling which is gaining rapidly in strength, that the human element must be recognized and cannot be so disregarded as to make the future workers mere automatic machines.

"The committee recommends that any technical education of the workers in trade and industry being a public necessity, it should not be a private but a public function, conducted by the public and the expense involved at public cost.

"We favor the establishment of schools in connection with the public school system at which pupils between the ages of fourteen and sixteen may be taught the principles of the trades, not necessarily in separate buildings but in separate schools adapted to this particular education and by competent and trained teachers.

"The course of instruction in such a school should be English, mathematics, physics, chemistry, elementary mechanics and drawing; the shop instruction for particular trades and for each trade represented, the drawing, mathematics, mechanics, physical and biological science applicable to the trade, the history of that trade and a sound system of economics, including and emphasizing the philosophy of collective bargaining. This will serve to prepare the pupil for

more advanced subjects and, in addition, to disclose his capacity for a specific vocation.

"In order to keep such schools in close touch with the trades, there should be local advisory boards including representatives of the industries, employers and organized labor.

"Experience has shown that manual training school teachers without actual trade experience do not and cannot successfully solve this great problem, and that progress will necessarily be slow, as new teachers must be provided, a new set of text books will have to be written and the subjects taught in a sympathetic and systematic manner.

"We advocate the continuance of progressive development of supplemental trade education, as inaugurated by trade unions, and call special attention to the work undertaken by the International Typographical Union in the establishment of a school for the higher education of its members."

Position taken abroad.

While industrial conditions in America differ from those in other countries, it is interesting to observe the attitude of foreign labor-unions toward vocational schools. A striking fact is the staunch endorsement given them by trades unions as well as manufacturers. The beginnings of

such schools were occasionally marked by misunderstanding and suspicion on the part of organized labor, but this hostility has entirely disappeared with the enlightened attitude of their unions, who find skill the basis of promotion. In many instances prizes for proficiency are offered by the unions and are much coveted by ambitious students. In some cities the work is backed financially not only by grants from national and municipal sources but by donations of both manufacturers and organized labor.

The trade union of Great Britain has urged parliamentary action which would further secondary and technical education, as an essential part of every child's education, and secured by such an extension of the scholarship system as will place a maintenance scholarship within the reach of every child and thus make it possible for all children to be full time day pupils up to the age of sixteen.

At a recent Irish trades union Congress it was agreed that the time at the disposal of apprentices for acquiring a thorough technical knowledge of their respective trades was at present entirely inadequate, and urged upon employers the desirability of granting further opportunities by allowing their apprentices a few hours' leave upon such days as they undertake to attend the technical schools so as to enable them to become more

proficient workmen. A resolution was passed urging that the Department of Technical Instruction for Ireland press this matter upon local technical committees and employers' associations throughout the country.

In France, the trades unions were at first hostile to trade schools. The opposition was based upon a misunderstanding of their intended scope. At the present time the graduates of these schools are looked upon as a great asset to the unions since they enable its ranks to be made up of the very best artisans obtainable. This standard is kept high by the appointment from the unions of visiting or advisory boards to keep in touch with the various schools and their work.

At a convention of trades unionists in Belgium in 1907 it was the consensus of opinion that industrial schools would produce workmen of more intelligence than those trained in the ordinary way. Efforts are made to learn when students are ready to qualify as graduates in order that the union may assist in placing them as apprentices and securing their membership in the organization.

In 1906 Switzerland passed a law compelling every employer of labor who seeks to teach a trade or accept boys or girls as apprentices, to allow these children to attend during the day, at least four hours weekly, such schools as will advance

or assist them in their chosen profession. This law was passed by a referendum vote of the people of the entire nation. It was favored by the wage workers and opposed by the employers. Recognizing the lack of a general system of industrial education and knowing that they must have schools of their own if they were to compete with the technically educated French and German workmen, the Swiss trade unionists have established such schools, and support them out of their own funds. At present the printers, painters, shoemakers and tailors are receiving a cantonal subvention to assist in carrying on their schools.

An important investigation.

In 1908 the Bureau of Statistics of the New York State Department of Labor, under the direction of Prof. Charles R. Richards of Cooper Union, made an investigation to determine the general relation of supply and demand in regard to skilled labor in the principal industries in the state, the conditions under which boys and girls enter the industries and their chances for advancement, together with the opinions of both employers and employees as to the value and need of industrial training outside of commercial establishments. The industries selected for investigation were those representing the prominent

skilled trades and the important mill and factory industries employing low or medium skilled labor. In addition, a few industries employing largely unskilled labor, such as laundries, the manufacture of confectionery, and paper box making, were added on account of the great number of minors engaged in such trades.

The replies of secretaries of the labor unions of the State to the question, "Do you favor a public industrial or preparatory trade school which would endeavor to reach boys and girls between fourteen and sixteen that now leave the common school in very large numbers before graduation? Such a school would not teach a trade but would give a wide acquaintance with materials and fundamental processes, together with drawing and shop mathematics, with the object of giving a better preparation for entering the industries at sixteen and better opportunities for subsequent advancement. The results are as follows: 1,500 answered "yes," 349 "no," 23 qualified "yes," 5 qualified "no," 574 not answering—total 2,451. Care, however, was taken in framing the question to bring out the fact that the school is not to teach a special trade but is aimed to prepare those below sixteen years of age to enter the industries at greater advantage, and this point seems to have been generally appreciated by those sending replies.

The returns from labor union offices in answer to the question, "Do you favor public trade schools for boys and girls between sixteen and eighteen, that would give two years of practical training together with drawing and mathematics, provided the graduates of such schools should serve two years more as apprentices or improvers?" will undoubtedly prove of much interest. 1,232 answered "yes," 567 "no," 71 qualified "yes," 7 qualified "no," 574 not answering—total 2,451.

These replies indicate apparently that organized labor has reached a point, at least in New York State, where it is taking a position of discrimination in regard to the question of trade schools. The feeling of opposition to trade schools on general grounds is being replaced by an attitude which favors a trade school administered by public officials that will stand for thoroughness of training and for a shortened period of practical apprenticeship in the trade before the journeyman's status is obtained. As for the opposition of organized labor to the school which gives a brief and superficial training and sends out the graduate to compete with the journeymen, it is shared by most fair-minded employers and other students of the subject. On the other hand, all experience, as well as intelligent forecast, makes it clear that organized labor need have no

fear of large increase in the supply of skilled labor through trade schools that limit the age of the student and which provide thorough and comprehensive courses of instruction under public auspices.

Labor and capital.

Capital is always able to take care of itself under economic laws that are well understood. It has a strong enough motive for activity in the hope of profits. On the other hand, labor has a stronger one in the need of bread. In the words of Andrew S. Draper, New York State Commissioner of Education, "In this country it is not in the nature of either to brook injustice, and the needs of each make it unnecessary that the other do so. In the last analysis each will have to square with the plan that stands fair, that encourages capital to provide labor for workmen by protecting all of the just rights of capital and that encourages the man to make the most of himself by assuring all of his just rights in individual industry and skill."

VII

CO-OPERATIVE SYSTEM OF INDUSTRIAL TRAINING

THE rapid development of the manufacturing interests of our country during the past decade, particularly in the metal-working lines, has increased the problem of finding an adequate supply of labor of a proper degree of efficiency. Manufacturers have for some time realized that the efficiency of the labor that offers itself for employment is not always of high standard. To a large extent this is due to the fact that manufacturing processes have become so highly organized that mechanics are not being made in the system of production. Add to this the fact that the great majority of applicants have not completed even the elementary school course and are not prepared to meet the problems that confront them upon entering the manufacturing establishments.

Factory waste.

While there is a greater subdivision of labor than ever, it is to-day acknowledged by builders

of machine tools that they need a working force of greater general intelligence than in the days when simpler machines and simpler processes were employed. A careful analysis of manufacturing conditions by experts has revealed a tremendous waste because of the abuse of machinery and tools and because of spoiled pieces resulting from a low standard of work. It is said that a greater part of this waste could be eliminated if there was a higher degree of intelligence on the part of the workmen. Obviously, this is the point of view of the employer. The modern system of production has had much to do with such conditions. The absence of a definite system of factory training has its share of the responsibility. These questions have been discussed elsewhere. So much from the factory side.

Boy economy.

Meanwhile, the public school desires to hold its pupils, but youth wants to earn money, and parents ask the eternal question, "What shall we do for our boy?" The mother sees that if her boy goes to work in the average factory he is likely to fail to learn a trade, while it is almost positive that he will shut the door against that further liberal education which he might get in the high school. The father and mother are earnest and willing to sacrifice heroically in order that

their boy may go on to the high school; but both are puzzled as to just what these four years will do for him. Their enquiry is serious and not unusual. Now, let us imagine that the boy is able to say, "Father, the problem is solved. The coöperative school is about to be opened. In it I will become a skillful machinist, able to earn more than a living immediately upon graduation and I will also have all the benefits of a high school education at the same time." This brings us to the coöperative system of industrial training.

The plan of operation.

The fundamental principle of the coöperative system is very simple. In brief it is this: the technique or the practical side of the work is taught only in a shop or store which is working under actual commercial conditions; the science underlying the technique is taught by skilled teachers in a public school. Every industrial center has a group of school buildings with its quota of trained teachers. It also has many factories and commercial houses that need skilled and efficient help. Under present conditions most of the children who leave the public schools go at once into the industries or stores and there is no connection whatever between shop and school. The children go to work for various reasons—some from personal inclination, others

because they have to become breadwinners. In consequence, there are on one hand many children working in some capacity in store or factory, and on the other hand, a series of public schools carried on only for those who are fortunate enough to be able and to desire to continue in their school work. To many it seems feasible so to organize the public school system that it would be capable of dealing with all these children—those in school and those out of school. It would seem that a solution of the problem would be some system of cooperation between the schools and the factories for training these young people in industrial and civic efficiency after they have found their work. Naturally, there are details which need to be considered for each particular industry or community. Such questions arise as to who shall supply the school teachers—the shop or the public; the hours the student works in the shop; the hours he is taught in the school; the periods of alternation of shop and school work, if alternating periods be used; and the curricula of the schools. These points are explained in the following description.

An educational innovation.

For several years, in connection with the engineering department of the University of Cincinnati, there has been in existence a system of

coöperation between the shops of the city and the university whereby the shop takes charge of the practical training of the students and the university teaches the theory. The course is of six years' duration. There are six classes and there is one shop coördinator for each class. The shop coördinator is a college graduate acquainted with shop practice. He spends every morning at the university and every afternoon in the shops and his function is to make a direct weekly coördination of the work of the shop with the technical work of the university. For example, one week he is at the shops of a local manufacturing company where he observes the student apprentices at their work. He takes notice of what they are turning out, the speeds, feeds and cuts of the tools, the angles of the various tools, how the batch of work is ticketed and set up, the power drive—in fact, everything of importance in connection with the manufacturing of the product. The next week the students are grouped together for two school periods when there are explained to them the particular functions of the machines and tools with which they were working during the previous week in the shops.

Meanwhile, the classroom teacher takes up all questions of speeds, feeds, cuts and required accuracy connected with the shop work. The proper method of ticketing the batch of work is

discussed and the system of shop routine is explained. Ultimately, all problems of shop organization and accounting, cost keeping, shop planning, power transmission, heating, ventilating and lighting are discussed during the six years' course. In addition, a card system is employed by means of which everything which the student does in the shop that exemplifies a theory taught in the university is brought to the attention of the teacher, who takes every opportunity to impress upon the student the relationship between theory and practice. It will be noted that out of the student's own experience is drawn much of his course in mechanism, thermodynamics, machine design and strength of materials. These subjects are a part of the college curriculum.

Conflict of opinions.

The coöperative effort between the university and the local shops has attracted much attention. In some respects it reminds one of the continuation school system in vogue in Munich. Its advocates claim that it has a great advantage over the plan of the public trade school, for, by the methods employed, the school is relieved of the necessity of equipping its laboratories with expensive machinery which in the course of ten or fifteen years may become obsolete. It is further claimed that the students are getting a practical

training such as it is believed that no school can possibly furnish. They are working in actual commercially operated plants where the hum of industry is on every hand and where push and go are necessary for the student to hold his own in the shop organization. Those who favor this system believe that, granting that economic necessity will compel the public authorities to establish such schools, the very extent to which a system of trade schools would have to be carried on in order to satisfy the necessities of all industries, would militate against the possibility of maintaining such schools.

The points referring to equipment and the practical aspect of the instruction can be taken up later. But the rather plausible argument in the last statement against public trade schools is worth considering at this point, for it is the crux of the whole question of public trade schools. Naturally, school authorities will reply that only the more important trades need to be taught in a public school system. This brings up three questions: first, who shall decide what these trades are, and how shall the public support be obtained for these few trades? second, are the other trades to be neglected, leaving the desires of the children or their necessities entirely out of the question? third, shall only a few be educated in the more important trades and the rest al-

lowed to shift for themselves as heretofore? The individual taxpayer, whose boy or girl wants to elect a trade which the schools do not teach, will demand an equal right to the sort of education desired for his child that is provided in other directions for other children. The question has been asked at various times whether a citizen has not the same right to demand that the public schools shall teach his son to be a printer as some one else has the right to demand that his son be taught to be a machinist. Shall the public school system say to the boy: "You must be a machinist, plumber, molder or woodworker, or go without a trade training,"—just because the local trade school happens to have only these four trades in its curriculum?

Such questions should not be difficult to answer. If there is public demand for a class in plumbing or printing or bricklaying, and there are twenty boys ready to join a class, it is feasible to start such a class in a special school, along with other classes, in the same way that the public now provides for the special needs of students preparing for the entrance requirements of our colleges and professional schools. One may visit many a high school where a fifteen hundred dollar teacher is giving instruction in Greek, or spherical trigonometry to a class of four pupils. Likewise expensively equipped laboratories in ad-

vanced chemistry are often in use by less than half a dozen pupils. After all, the point of view often determines educational procedure.

Moreover, it is possible so to group the various trades and occupations as to make comparatively few courses of instruction cover the educational needs of many lines of industrial activity. An analysis of any vocation, whether it requires extensive or intensive preparation, will show that back of it lies a body of technical information which is within limits of the capacity and need of each worker. Such studies constitute vocational tools and may be used in a majority of specialized occupations when the latter are grouped so that each one represents certain distinctive processes connected with common materials. There is, for example, the wood-working group, the iron and steel working group, the clay and furnace working group, the cloth making group, etc.

Advantages of both.

There are well defined and distinct advantages in both systems of industrial training—coöperative and trade school. It is hardly necessary for partisans on either side to overreach in their arguments. The real issue at stake is not whether the coöperative system is the only proper system of training, but rather, to what extent

can each system find its proper place in American education. There is room for both, and an analysis of the principles involved is well worth while at this point.

Standpoint of equipment.

Undoubtedly, the coöperative system is economical from the standpoint of school equipment. It places upon the taxpayer almost no burden of taxation, as the existing equipment of commercial shops is used. Moreover, it places upon the public school authorities no great problems which are entirely novel and untried and which may require the expenditure of public money along new channels. In some lines of industry the equipment will become obsolete in from seven to ten years and to properly teach the trades in schools will mean the remodelling, to some extent at least, of the equipment at least once in this period of time. It is stated by Dean Schneider of the engineering department of the University of Cincinnati that twice the number of students are taught under the coöperative system at two-thirds the cost of the former system of school shops and that it turns out practical engineers which the old system could not do. The coöperative plan will allow the money that was formerly sunk in physical equipment to be re-

placed every few years, to be used in paying higher salaries to superior teachers.

It is obvious, of course, that trade schools are necessarily somewhat expensive. The same may be said of dental, medical, agricultural and mechanic arts schools. But it is doubtful if the public will be willing to make any unjust discriminations based upon financial considerations against a necessary and proper industrial training of the mass of our people who work in the great constructive industries, in favor of those who are engaged in professional work. One might as well say, "Do away with our medical schools and let the students practice on the public and pick up their profession, for these schools are expensive and the apparatus and medical theories become obsolete every few years."

Standpoint of teachers.

Furthermore, it is claimed that educational waste will be avoided in the coöperative system by using foremen in the shops as teachers of shop-work rather than teachers specially trained. To quote from Dean Schneider: "Such waste ought to be avoided just the same as waste of material resources. And it would be educational waste to try to imitate shop conditions and shop practice in our public schools upon a large scale, such as

specific trade education requires, if such schooling is to amount to anything, when there is a lack of a sufficient number of pedagogically trained teachers." Undoubtedly, the merely academically trained teacher cannot teach a trade. On the other hand the practical mechanic without pedagogical training may be able to impart to the student the mechanical manipulations of his trade, but he cannot make the proper connection with the pedagogic end of his work, and he will be deficient to that extent.

But it must be remembered that every new educational movement has suffered at its inception from the lack of skilled teachers. This was true in the early days of the movement looking towards the teaching of science, manual training and commercial branches in our schools. It is hardly necessary to hesitate in a new movement because of an insufficient supply of teachers. Of course at present there are few teachers because there are few schools demanding them. But the law of supply and demand will adjust this matter. No one can expect that a thousand young men are going to prepare themselves for teaching in trade schools when there may not be a hundred positions at present in view requiring such men. The question of training suitable teachers is taken up in the last chapter.

Wasting time and money.

Another point in favor of the coöperative system—one which comes under the head of educational waste—refers to the fallacy of attempting to give specific trade education to a boy of sixteen years of age when he does not know what trade he wants to learn, or when he can hardly afford to spend three or four years in a trade school without compensation. It is stated that on entering a shop he would receive low wages instead of the high wages which he expected, because of the lack of that practical experience which can be acquired only in the commercial shop. The record of the graduates of trade schools answers this argument.

Moreover, another weakness of the public trade school is said to be the break in the continuity of systematic mental effort which will exist between the period at which the boy drops out of school at fourteen and the trade school period when the boy enters it at sixteen; this lack of continuity forcing the trade school to gather up the interrupted, loose and disorganized threads of mental activity. If the advocates of the coöperative system feel that they must oppose the public trade school movement by such an argument, they have at least furnished a valuable contribution toward an argument for vocational training between

fourteen and sixteen. In fact, no stronger argument could be used. Such training is intended to arouse a set of industrial interests which will require specific trade training for their satisfaction; the latter training to be given either in the trade school, open to pupils who are sixteen years of age, or in the shops themselves. There will be less educational waste to the boy, as well as less economic waste to the public, if he is in some school where he is discovering his probable vocational pursuit instead of wasting two years in a line of work which does not give him a chance, educationally speaking, to discover himself.

Learn and earn.

Open to boys who are sixteen years of age, the coöperative system makes one strong appeal. It gives them an opportunity of earning something. They are earning while learning, whereas under the trade school system they do not earn until they have completed their trade education. The coöperative system makes it possible for a child to continue in school whereas now he is compelled to take a low grade, poorly paid, unskilled position perhaps without any future prospects either in money or the acquirement of skill.

Evidently at first sight it would appear that the coöperative plan, involving the city in practically no expense and paying wages to the boys, was by

far the least wasteful. For example, in the Fitchburg, Massachusetts plan, which is described later, the boys give four years' time and in return receive $544.50 in wages and are taught a trade besides. On the other hand, in a public trade school, it might take the same number of years to learn the trade, but the boys would not receive any money. Assuming that the boy may continue to work for thirty years after leaving the school, the sum of $544.50 spread over thirty years amounts to about six cents a day. Therefore, it only becomes a question of whether the boy, trained in a public trade school, can earn six cents a day more on the average than the boy trained under the coöperative system. The advocates of the public school idea claim that the difference between their boy, who is under an instructor whose business it is to teach the trade, and the boy trained in a shop, who is under a foreman whose business it is to get work out, will make the six cents difference look small.

Coöperation between shop and school.

The coöperative system will naturally serve to keep the business men and employers in constant touch with the public school system if for no other reason than the selfish incentive to get the most out of it for themselves. Given an opportunity to coöperate, it is expected that they will

study the schools with their own needs in mind, and as one result they may possibly become interested and aroused enough to keep reactionary elements out of boards of education as well as to secure larger school appropriations. But if the employers, as a whole, do not exhibit an interest in the schools, at least there can be coördination between the school instructor and the shop force. So far, in carrying out the coöperative plan in the cities which have tried it, the instructors have been acquainted with the local shop practice. They spend part of the time in the shop and part of the time in the school. It is their business to observe the students at their work, to study the shop system and any technical matter of interest, noting particularly the every-day shop applications of the various sciences, such as mathematics, physics, chemistry and drawing. This enables them to select examples and subjects for instruction which vitally interest the boys and hold their attention, as they see the reason for the given problems of the classroom. As an illustration, take the teaching of the upright drill. A large drawing of one is made so that all can see it; then each student has a trade catalogue of this drill and turns to it while the instructor shows how to find the speed of each shaft and of the drill. In general, catalogues of machine tools are used very freely as reading lessons and in

such other ways as will familiarize the boys with the different tools.

Sentiment of trade unions.

It has been believed that the coöperative system would not be opposed by the trade unionists. One would hardly expect that they would oppose a scheme that takes a young person who has already obtained a foothold in a trade and gives him instruction in a school that makes for greater industrial efficiency. Nevertheless, at the present writing the scheme has not received the hearty endorsement of the labor unions—at least, if one may judge by the statement in the special report on industrial education of the American Federation of Labor: "Any scheme of education which depends for its carrying out on a private group, subject to no public control, leaves unsolved the fundamental democratic problem of giving the boys of the country an equal opportunity and the citizens the power to criticize and reform their educational machinery." Undoubtedly, the committee that wrote this report felt that it was justified in condemning any system of public instruction, privately controlled, or any scheme of private selection of pupils. As will be seen later in the description of the Beverly and Fitchburg schools, the scope of the coöperative instruction in these cities does not appear to be dedi-

cated to the common interests of all without conditions and reservations.

Application to other trades.

It is expected that the coöperative system can be applied not only to the machine trades but also to the tailoring, baking, butchering, building or any other trade, where the mechanical equipment or natural conditions are somewhat different from the trades which have already adopted the system. Already a department store in New York City has introduced a system which is suggestive of what might be done by coöperation between public school authorities and private concerns. In common with most stores of this class, the clerks are not very busy until ten o'clock in the morning; hence, the store can easily get along with one-half of its clerks, from eight to ten o'clock one-half of them receiving two hours' instruction daily for a week while the other section is working, alternating the following week with the other half of the clerks. In this case, the students do not go to school but the teachers go to the stores. Some of the large rooms, such as carpet and lace rooms, are being used as schoolrooms, the chairs being removed at ten o'clock, but sufficient space reserved for any business that may be necessary up to that time. Among other things the salespeople are taught psychology of salesmanship,

and are given as much technical knowledge as possible of the things they are selling. In addition, they receive a certain amount of general education.

An interesting experiment.

Three years ago the Women's Educational and Industrial Union of Boston started a class in salesmanship. It consisted of eight young girls. These girls were so young that at the close of the three months' course, those who did succeed in finding store positions had to go in as stock or cash girls. The only regular selling experience had been in the food salesroom and the handwork shop managed in connection with the Union, and there was no definite connection with the stores. Later it was felt that actual store experience was necessary and also some guarantee that candidates who succeeded in the stores would be assured positions.

Finally, in 1908, one of the largest dry goods stores offered to coöperate. It agreed to take the Union class on Mondays, giving them experience and a small compensation, and also expressed a willingness to consider promising candidates for positions in its store, and every opportunity was given to the director of the class to gain experience by selling goods in that store. Later, five other stores extended their assistance. The

superintendents of these stores formed an advisory committee, meeting once a month with the president of the Union and the director of the class, for discussion and conference. The policy, as planned with the advisory committee, was that candidates, if approved by the director, should be sent to the Union class from the stores and admitted to the school. After one month in the class, candidates were promised store experience on Mondays in the store which had accepted them, and the stores paid for this service one dollar per day. They were also guaranteed permanent positions in these stores at the close of the course if their work was satisfactory after one month's probation.

The aim of the present course is first, to develop wholesome, attractive personalities; and hygiene, especially personal hygiene, is taught, including study of daily menus for saleswomen, ventilation, bathing, sleep, exercise, and recreation: second, to become familiar with the general system of stores; sales slip practice, store directory, business forms and cash accounts: third, to increase knowledge of store stock, its color, design, and textiles: fourth, to study selling as a science, including discussion of store experiences, talks on salesmanship, such as attitude to firm, customer and fellow employee, demonstration of

selling in class and salesmanship lectures: fifth, to get the right attitude towards the work.

At present the course extends for four months, with a daily session of three hours. Demonstration of selling is conducted like the teaching lessons in normal schools. Real customers, chosen because they represent different types, buy real articles. The sale is watched by the class, notes being taken of strong and weak points. Naturally, the note-book work gives good material for study of English expression, including spelling, punctuation and penmanship. When the sale is finished, the one who has made the sale is allowed to criticize her own work, then the class criticizes, the customer tells why she did or did not buy the article, and the whole is summed up by the director. As far as possible the class work is correlated: the drawing work consists of store plans and designs for costumes; the spelling brings out names and addresses and store English; when the girls are sent to various stores for samples, salesmanship, color, design and textiles are studied. The manner of the salesman in giving the sample is observed and reported, the color and design are used in the color lesson and the material in the textile work. If the textile being studied is wool, one of the store lectures at that time will be on wool or woolen goods. Practical

talks by experienced salespeople, buyers and superintendents are given twice a week to the class on subjects such as "The Department Store's System and Saleswoman's Place in It," "How to show Goods," "Trifles," "Textiles," "Service to Customer."

Already some of the store superintendents admit that three well trained saleswomen can manage a counter better than six indifferent ones, and that three well trained women with good salaries cost the store no more than the six inefficient ones. Moreover, women looking upon salesmanship as a vocation, with ambition to advance, will command higher wages; conversely, stores offering higher wages will demand trained workers. It is believed that ultimately this will mean increased business for the stores, better service to the public and a higher standard of living for the workers.

A plan for high schools.

The Cincinnati coöperative scheme is planned with reference to the needs of university students in engineering. The Fitchburg, Massachusetts, plan of coöperative industrial education is an arrangement between the high school authorities and the local manufacturers of metal machinery, saws, engines, pumps and condensers and other

metal products. It covers a four years' course. In the first year it is all school work; the next three years school and shopwork, with one week in school and one week in the shop. The boys work in pairs; for example, a shop taking eight apprentices, has four working at all times. Some definite plan is required to make a smooth running system of alternation. The boy who is in the school one week and expects to work in the shop the next week, goes to the shop on Saturday before closing time for an hour and watches the job his alternate is on. He is then prepared to take up on Monday morning the operations with which he has previously made himself familiar and has gained from his foreman such additional information as he feels he may need. This plan differs from the public trade school, where any student may enter and go entirely through a three or four years' course without regard to his mechanical ability or fitness for such work, in that the employers drop out the "dead wood" and allow only those to remain who will make high grade mechanics. It is a close copy of the Cincinnati plan, except that the boys are younger, the school work is of high school grade only, and the aim is to train mechanics and not engineers. So far as the pairing of the boys and the alternation of work between school and shop are con-

cerned, the methods are identical. Candidates for the course are restricted to those who have finished the grammar school work and so far as actual starting upon the shop work is concerned, the restriction with reference to the first year eliminates all who have not completed a full year in the high school. This academic restriction, combined with the requirement of the satisfactory completion of a two months' trial term in the shops in the second year, serves to eliminate unsatisfactory material. This trial period is exactly the same as is common in the regular apprenticeship agreements. If the boy does not care to continue he may stop, and if the manufacturer feels that the boy will not succeed as a mechanic he is told to leave. A formal indentured apprenticeship agreement is executed subject to the apprentice doing satisfactory work in both school and shop. This bond impresses the apprentice with the fact that he has entered into a business agreement, approved and guaranteed by his parents. The rates of pay for the three years of coöperative shop work and for the actual time spent in the shops are as follows: For the first year ten cents per hour, for the second year eleven cents per hour and for the third year twelve and one-half cents per hour. While the half-time plan is carried out during the school year, full time work is provided for the apprentices during the

school vacations, except that a two weeks' vacation is given them each summer.

Since the school time is only twenty weeks a year it is evident that only such subjects can be taught as are of practical value to the student in the pursuit of his livelihood. The manufacturers insisted that the bookwork be such as would make the boys better mechanics, capable of advancing to the highest possibilities in the trade and that all superfluous subjects be left out. They have said "better a little done well than a smattering of a large variety of subjects." The regular courses of study in the high school were discarded, precedent was ignored and such subjects were selected as would fit the students to be intelligent mechanics.

The book studies.

English is given throughout the four years in order that the boy may speak and write intelligently various forms of business papers and shop terms. If he applies for a position the form in which he presents that application will largely determine whether or not it will be considered. Again, the mechanic who is sent out to do a job on his own responsibility is often required to make written reports to his employers. The course in current events and industrial history deals with the daily happenings in the industrial

world, the history of the iron industry, factory system and labor problems, new inventions and the reading of mechanical journals.

The mathematics begins with simple propositions in mensuration, fractions, metric system, circular measure. It extends into general shop mathematics, dealing with problems on cutting, speeds, feeds, belting, gearing, strength of materials and general cost figuring. Algebra is then taken up to give facility in using the formulae so common in the trade journals and handbooks, leading up to simple applications of geometry and trigonometry. The practice rather than the theory of mathematical science is sought.

The work in mechanism treats of the construction and uses of the various machine tools that every shop contains. The names and uses of every part are learned in the school as well as in the shop. The reason for the shapes of the various parts, kinds of material used in their construction, shapes and kinds of tools used and their cutting action, is clearly pointed out.

The chemistry takes up the nature and qualities of metals and salts, with consideration of the tests that ordinarily can be applied to fractured metals, hardening and tempering processes.

Commercial geography includes the study of the source of supply of materials of the various industries, preparation and methods of transpor-

tation, including railway systems and waterways.

A course in first aid to the injured is given, for there is no place where accidents are more liable to happen than in the shop and some knowledge of how to care for them is a valuable asset to the workman.

Naturally, a strong course in drawing is offered, as it is the sign language of the mechanic, for almost invariably in explaining an object or piece of work he takes his pencil and makes, or attempts to make, a drawing to reënforce his remarks. A large share of the drawing course is given to freehand work. It begins with simple objects and then takes up machine parts. In this way the boy sees the object and at the same time becomes familiar with the proportions and shapes of ordinary machine parts. Later he draws them mechanically with instruments to scale.

In the course in business methods there is the study of the organization of shop systems, including the receiving of materials, laying out of work, tagging, inspecting and routine of work through the shop. In this way the boy sees the dependence of one department on the other; the necessity for the coöperation of all to insure good results. He appreciates the cost of doing business and he sees that it is not all profit and it costs something to erect and equip a manfactur-

ing plant, conduct an office and maintain a corps of salesmen and advertising agents.

It is to be noted that the actual instruction in shopwork is by the shop foremen in the various local shops, as the number of boys at work in any shop is not sufficient to justify the employment of a shop teacher; the extenuating circumstances being that the local manufacturing enterprises are not of that great magnitude which leads to an apprentice being lost sight of. Moreover, as an important safeguard, the school instructor regularly visits the shops and supervises the work given to the boys. The apprentices are given to understand that they are at full liberty to complain to the class teacher in case they are not satisfied with the work given them. In this way substantial check is placed upon the tendency to make an apprentice into a stockroom clerk or otherwise give him work not in accordance with the spirit of the apprenticeship agreement. These papers, signed by both manufacturer and apprentice specify that the boy shall be taught the fundamental operations of various shop tools and processes under competent foremen—a provision that is usually lacking in apprenticeship papers.

A valid objection.

There is an apparent onesidedness in this agreement between apprentice and employer which it

appears might be avoided. While it may be said that all these employers are men of known integrity, on the other hand, the success of the whole scheme depends entirely on their doing what they ought to do.

Undoubtedly there is much of value in the co-operative scheme, but before it can have general endorsement, the public must be assured that the plan is so worked out that it results in all-around training and that the half-time idea does not become a half-way scheme. To the careful observer, a plan by which the pupils are indentured under a forfeit to stay four years is hampered in various ways for, on the whole, it is less favorable to the apprentices than to the manufacturers. The pupils that are merely taken into the shops on the half-time, or coöperative plan, may not receive that systematic and progressive advancement in learning the different parts of the industry that is desirable. To a certain extent, the pupils may be exploited for the benefit of the manufacturer, for the money value of the product of the boy's labor often seems to be more determinative to the manufacturer than the pupil's progress in learning the trade. On the other hand, in a public trade school where the work is not carried on under the conditions of a real factory it may be impossible for the pupil to attain a practical skill and efficiency

equal to that of a good workman in a factory. Of course much depends on the way the school is conducted. Unless the method of instruction in the average school is different from that at present in vogue in most of our manual training schools, the workman's time, as a factor in the cost of production, can never be sufficiently demonstrated to a pupil where his presence and wages do not depend upon his active productive ability. Neither can the time that may properly be used and the skill required for the different operations be sufficiently understood by the pupil until the product is put to actual commercial use and the pupil rewarded for his work in proportion to his perception and adjustment of these factors of production. This is the strongest argument for the coöperative plan.

A public trade school must establish and maintain its own standards of efficiency in workmanship and production, and its own esprit de corps among its students and its own standards of scholarship and equipment, while the industrial school that is affiliated with a first class factory on the one hand and a first class school on the other, without being dominated by either factory or school, has constantly before its pupils the best standards, both industrial and educational, which must be powerful incentives to the pupils of the school.

A better plan.

The Massachusetts Commission on Industrial Education in 1909 endorsed a coöperative scheme between the public school authorities of Beverly, Massachusetts, and a local industry. It is an excellent example of what a small city can do for industrial education and of a way in which manufacturing interests and school authorities can cooperate to mutual advantage in solving a troublesome educational problem. Beverly is a small city of some 17,000 inhabitants. In manufacturing there are but two industries—the making of shoes and the making of shoe machinery. The latter is by far the more important, employing some 3,000 men and occupying a new and thoroughly modern plant. A proposal was made to city authorities by the United Shoe Machinery Company. This proposal was: "A separate department will be organized in the factory of the United Shoe Machinery Company and equipped with all necessary machine tools for the accommodation of twenty-five boys at one time. Two groups of twenty-five will alternate between the factory and the schoolhouse. The Company will furnish all material and keep the accounts as proposed, and purchase the products at established prices. The United Shoe Machinery Company will make up the deficit between the earnings of the factory shop as shown by the account de-

scribed above and the cost of maintenance of the factory shop including the salary of the instructors while in the shop. The hiring of the shop instructor or foreman will be in the hands of a local committee on industrial education." In the plan as put into operation the management and control of the school are vested in a board of trustees, composed of the Mayor, five members of the school committee and one or more citizens appointed by the Mayor. It is provided that each proprietor of an industry who provides shop facilities satisfactory to the trustees shall be represented by one member of the board, nominated by the proprietor of the industry and appointed by the Mayor. The school is divided into two classes of twenty-five each. One class reports to the shop for a week's work, the other to the schoolroom for a week's instruction; at the end of the week the classes change places. Schoolroom facilities are provided in the high school building and include the use of regular high school equipment for the teaching of drawing, blueprinting, physics, chemistry, business forms and methods and the like. The city set aside a small classroom with desks for twenty-five boys, representing a cost of perhaps a few hundred dollars. On the other hand, the United Shoe Machinery Company set aside a much larger amount of floor space and an equipment of machine tools

representing an aggregate value of about fifteen thousand dollars. In the high school the boys are taught mechanical drawing, shop mathematics, fundamentals of physics and chemistry, English, business forms. The school day is of eight hours for five days a week. Saturday is given as a full holiday. No home lessons are required. At the factory the aim is to teach skill in the trade under actual shop conditions. Thus regular machine parts are selected involving operations suitable for instruction and sent to the school shop department. Here they are given to the boys together with the regular outfit of jigs, fixtures and other special tools which are used in a regular manufacturing department. No changes whatever are made from regular shop manufacturing conditions. The boy takes his job and may at first perform only one operation until he has mastered the use of the various tools. After that is done he takes his job and carries it through, operation after operation, until the part is finished. As a rule, if a job is not finished during the week in which he is in the shop, it is laid aside until he comes again. In special cases it may be finished by another boy in the school shop or sent to a manufacturing department. Each operation is inspected by a regular shop inspector under exactly the same conditions and with exactly the same care as if the work came from a manufac-

turing department. In this way the atmosphere, hours, methods, accuracy and efficiency of the shops are constantly with a boy throughout his entire course in the shop school department. All of the work furnished is piece-work and the boys are paid one-half of the regular piece-work rates; the other half is withheld as a partial reimbursement to the company for the expense of maintaining the department. On this basis the boys average while in the shop two dollars and fifty cents to three dollars per week in wages, the amount of the earnings depending largely upon the energy and diligence of the boys. There are two instructors, one for each class, and each instructor stays with his class, alternating between the shop and the schoolroom. The instructor knows what work each boy has done in the shop and is able to adapt the schoolroom instruction to it, to explain and fix the principles upon which the shopwork was based. At the same time he has no chance to become merely a teacher and grow away from the shop; or merely a shop instructor and grow away from the classroom viewpoint.

Advantages.

An attempt has been made to have real coöperation between the school authorities and the manufacturer; there has been no heavy burden placed

upon the taxpayers of the city for equipment; the school authorities have had no complex problems in trade teaching to face and solve; and the shop has not attempted to add school training to a manufacturing business. The boys get their school training where they always have received it, in the school; and again, they get their shop training where trades have always been taught in the shop.

A summing up.

The coöperative system has tremendous advantages. In presenting it an attempt has been made to be fair to both the public trade school and the so-called "Cincinnati scheme." Certainly the plan is worth trying. It is very largely based upon a German method. The success of the German system is due not only to the fostering care of a central government but in a large measure to social and economic conditions inherent in the situation. In that country it is taken as a matter of course that employers and schools will work together to promote thorough industrial training. In such an atmosphere the coöperative scheme can achieve its highest development. In America conditions are different. Employers have not taken, up to the present time, any great interest in the work of the public schools except to criticize them. Neither have school men taken any

interest in the labor conditions in our industries. Evidently the coöperative system offers a means of getting together. But if the school authorities adopt this plan simply to avoid spending public money, and employers take up the scheme in order to throw the burden of responsibility for obtaining skilled labor upon the public schools, simply because they have been negligent in the past in doing what may have been their duty, then the scheme is doomed to failure. The co-operative plan must get beyond selfish, personal motives if it is to be a part of an American system of education. Primarily the schools are managed in the interests of its boys and girls. There is no cause for dampening the ardor of those that favor the coöperative system, but no association of employers can be allowed to dictate a system of public education unless it be along the lines which are of direct personal advantage to the boys and girls. Then it will not be dictation, but coöperation, which is welcome to us all.

VIII

SCHOOLS IN THE FACTORY

IT is commonly stated in America that the practice of indenturing apprentices for the purpose of giving young men instruction in the art and mastery of a trade has become obsolete. Moreover it is claimed that, with the beginning of production on a larger scale in the manufacturing plants which succeeded the earlier workshops of the first part of the nineteenth century, the apprentice ceased to exist except in name, and the term is now loosely applied to young workers in a factory, not there to learn the definite processes of a trade, but to operate machines which have displaced the skilled adult journeymen. Certain it is that with the introduction of labor-saving machinery the old system of apprenticeship declined, and where it did exist, it changed form so that the indenture was no longer a legal relation.

Passing of the old order.

Nor have the rapidly changing industrial conditions of the past hundred years been such that

the personal relation between the master and the apprentice could be preserved. A century ago a master workman could agree "to teach the craft without any concealment." He knew the whole of his trade and had the chance to practise it every day. But shop conditions of that time were vastly different from those of to-day. There was little subdivision of labor and no elaborate factory system. With the universal adoption of labor-saving machinery it became possible for many untaught hands to turn out the work in the rough for the skilled few to finish. This new method of production prevented the young apprentice from securing definite instruction. He could not look to his employer or superintendent as these had numerous other interests; nor could he turn to the journeymen, as few journeymen were willing to take the time to teach a young factory hand while laboring on piece work or at fixed wages with the demand that a certain minimum amount be accomplished in a day.

The days when clerks were articled, when boys were bound for a term of four to seven years with the carpenter, tailor, shoemaker, blacksmith and wheelwright, and learned their trade from the thorough instruction of their master, not picking it up by observation as the "helper" or "assistant" often does to-day, are a part of the old order which has given place to

the new industrialism. It is to be regretted that with the passing of the old form, no general provision was made for giving instruction in the trades so necessary for the transfer of skill from one generation of workers to the next.

Early apprenticeship.

The beginnings of apprenticeship are not clearly defined. When the workman rose out of slavery, some division must necessarily have been made between learners and experts. In the fourteenth century the craft guilds had a well defined system of teaching beginners. Their indentures show that the apprentice bound himself from four to eight years to do the master's bidding and to be economical in the use of goods, also to behave himself in a seemly manner, and not to carouse or gamble. In return the master agreed to furnish him all necessary food, clothing and shelter; also to teach him the art and mystery of the trade. He was a part of the master's family, and for his conduct in the city, his master was responsible to the civic authorities.

The following form of indenture of that period is of interest:

"This indenture made the XIII day of September in the year of the reign of King Edward the IIIrd between John Gare of Saint Mary Cray in the County of Kent, cordwainer on that one

partie and Walter Byse, son of John Byse, sumtyme of Wimelton, in the same County, fuller on that other partie, Witnesseth that the saide Walter hath covenanted with the said John Gare for the time of VIII yeres, and that the saide John Gare shall find the saide Walter mete and drink and clothing during the saide time as to the saide Walter shall be according. Also the saide John Gare shall teche the saide Walter his craft, as he may and can and also the saide John Gare shall give him the first yere of the said VIII yeres iiid (3d) in money, and the second yere vid (6d) and so after the rate of iiid to an yere, and the last yere of the saide VIII yeres the saide John Gare shall give unto the saide Walter x shillings of money. And the saide Walter shall well and truly kepe his occupacy on, and do such things as the saide John shall bid him do, as unto the saide Walter shall be lawful and lefull, and the saide Walter shall be none ale goer anyther to no rebeld nor sports during the saide VIII yeres without the license of the saide John. In witness whereof, the parties aforesaide chaungeable have put their seals this days and yeres abovesaide."

Its decadence.

The gradual decadence of this former method of teaching boys the knowledge of a craft may be

ascribed to various causes, all of which have their roots in the economic changes wrought by machine industry. In general, they may be summed up as follows: first, production on a large scale which destroys the personal relations between employer and employee or master and apprentice; second, the extensive use of machinery and subdivision of labor; third, the unwillingness of employers to take on apprentices; fourth, the unwillingness of journeymen to instruct apprentices; and fifth, the dislike of boys for apprenticeship. These points will be taken up in order.

Absence of personal relations.

In olden times the apprentice was under the direct supervision and responsibility of his master, for his training and his moral conduct. Such close personal relations between apprentice and master, under the modern system of production on a large scale, is utterly impracticable. The employer is no longer responsible for the training and conduct of the apprentice, even in cases where the apprentice is duly indentured. The duty of supervising the training of the apprentice in modern workshops is relegated either to the foreman or to the journeymen, or it is entirely neglected. The speed and stress under which modern industry proceeds do not permit the journeymen to be diverted from their labor in order to look

after the apprentice's instruction. Consequently, the apprentice, instead of being trained to do journeymen's work, is not uncommonly given odd jobs around the shop, acting as errand boy and handy man. The boy soon realizes this condition and applies for work on the automatic machine where he can do piece work and where he can earn more even if he cannot learn as much.

Revolution of industry.

Robert Louis Stevenson has said, "If a man love the labor of any trade, apart from any question of success or fame, the gods have called him." But what about the man that awakens some morning to find a machine standing in his place doing the work which he performed the day before? Inventions have been introduced so rapidly and extensively during the last ten years that many trades have been almost revolutionized. The rapid introduction of machinery has a tendency to depress wages, at least temporarily, and labor organizations are constantly endeavoring to combat this tendency. This lack of security has been the cause of many a mechanic advising his boy to enter business or professional life.

While the new processes of manufacture may temporarily embarrass numbers of industrial workers, in some trades at least the increased need of skilled men, resulting from these indus-

trial changes, will readily furnish employment to the same workers, providing they have the requisite mechanical adaptability. It is the unanimous opinion of machine tool manufacturers that a certain number of all-around workmen are needed, even where extensive specialization is employed. They state that the demand for men broadly trained and having considerable industrial intelligence is increasing.

Attitude of employer.

Owing to this disintegration of trades neither employers nor employees are particularly desirous of having apprentices in the workshop. The implied expense of training apprentices, together with the losses frequently resulting from material spoiled by them, or the impossibility of marketing their product, leads employers to seek additional mechanics from laborers and helpers rather than train apprentices for this purpose. Some employers very frankly state that they prefer to take a "lumper" and make a mechanic of him rather than to spend their time with boys.

Attitude of employee.

In a number of industries which have been badly disintegrated, it is almost impossible under normal conditions for the apprentice to receive a regular course of instruction, for if the modern

apprentice is to receive instruction at all in the shop, it must come principally from the foremen and journeymen. Few journeymen have any direct interest in the apprentice. They rather regard the apprentice as a rival who may eventually take the bread out of their mouths. The consequence is that the instruction of the apprentice is frequently neglected; as a result a boy, instead of being trained as an all-around and efficient mechanic, is merely put to work at some simple occupation in which he readily becomes a proficient as well as a profitable employee. *The apprentice thus tends to become a specialist.*

Attitude of boy.

It is unfortunate that boys ordinarily prefer the casual system of learning a trade rather than the definite method of apprenticeship. Various causes have combined to produce this effect, the most important of which are: First, the long and excessive term of apprenticeship with one employer and the low wages paid to apprentices, especially during the early period of their training; second, the increasing age at which young people now begin their industrial career; and third, the possibility of acquiring some craft knowledge as a machine hand. These objections have been noted by the employers, and their trade associations have arranged in many instances a

form of indenture that meets the questions of higher wages and length of the term of apprenticeship which are raised by the boys. The danger of the methods adopted are referred to later in this chapter.

A natural death.

The decadence of the old apprenticeship system was not an unmixed evil. In no sense of the word would it meet the present industrial conditions. It may form a fine mental picture to look back at the boy indentured to a master craftsman binding himself for a term of seven years, living in his master's house, sitting at his master's table, attending his master's church, and starting out at the completion of his term of service on life's road with a new suit of clothes and a word of God-speed. The form of an early American indenture would to-day seem odd to us: "The apprentice is to keep the master's secrets, do him no injury, not to frequent taverns, to commit indiscretions, nor commit excessive waste on his goods. He is not to betroth himself without his master's permission. He is not to wear certain garments, play at dice, checquers, or any other unlawful game. The master agrees to find him in all necessaries, food, clothing, bed, and so on, for seven years and to teach him the craft without any concealment."

But there is another side to the picture. The

boy was robbed of his time, for it would have been possible, through a more definite training, to have taught him the trade in much less time than the seven years nominated in the bond. Moreover, living in his master's house was not always a bed of roses, for many times he was expected to mind the baby and to sit up nights to watch the fires. To be sure, he had the opportunity of working under one master craftsman and eventually absorbed all the skill and knowledge of his master. The master knew the whole of his trade and practised it every day. No one with a right understanding of present production, its spirit, purpose and methods, would advocate for a moment a return to the old system of manufacturing; yet no one can expect to renew the former methods without a return to the older industrialism.

Perpetuation of skill.

Many industrial establishments to-day, however, are not blind to the need of training labor in their own works, notably, manufacturing firms in machine tool building, in jewelry and silversmithing and in shipbuilding. In this direction, the National Metal Trades Association has been especially active and has formally declared that "a proper apprenticeship system is essential to the education and perpetuation of skilled mechanics." Consequently, it has devised a form of indentured

apprenticeship to meet the new order of production. These employers state that a modern form of indenture guarantees to the boy the opportunity to learn his trade as a whole; a fixed wage and a steady increase; and more rapid advancement in trade training. To the employer it guarantees continuous service of the boy during a definite time; a better grade of boy, for an employer will not enter into a contract covering several years with a boy whom he does not select with care; and more faithful service on the part of the boy, as he realizes that his interests are bound up with his employer's and that his advancement depends upon improving his opportunity. In a word, the employer wants a number of all-around workmen, not specialists alone, and he is willing to provide means for giving the necessary training, if he can be assured the boys will stay a definite time. On the other hand, bright and ambitious boys are willing to give the time necessary to learn a trade thoroughly, provided they can be assured that the opportunity will be given them. The new apprenticeship indentures are supposed to guarantee to both parties a faithful performance of this mutual service.

Good, bad and indifferent.

Unfortunately the guarantee does not always hold good, for one finds various kinds of appren-

ticeship agreements and even more grades of fulfillment by both parties to the agreement. Present systems range from those which merely indenture the boy for a term of years with a gradual increase of wages but without any definite system of shop training and no attempt on the part of the employer to keep the agreement with the boy that "he shall be taught the art and mysteries of the trade," to the system employed by some of the best industrial establishments where definite facilities are offered through "schools in the factory" where the boy may learn a trade and where even his personal habits are watched.

In assisting Carroll D. Wright in an investigation of the apprenticeship system I had a given list of a number of concerns that were supposed to have a plan for training indentured apprentices. Imagine my surprise when I discovered that more than half of these firms made absolutely no provision for carrying out their end of the agreement beyond providing work and paying wages. These employers were making no attempt to give systematic instruction in the "art" of a trade, and as for its "mystery," it was evident this quality existed in the hide-and-seek game that the boy had to play in order to find any trade training at all. However, I must say that few of these boys seemed to object as long

as they had the regular advance of wages agreed upon.

In the machine trades, there were few concerns that had no system; the great majority had some system of indenture extending over a term of years; a small majority had a very elaborate scheme whereby they gave a trade training which could compare favorably with the best public industrial training which could be offered. The building trades had a system of apprenticeship nearly as definite as of old, due in a large measure to the nature of the trade, for building materials are still placed by hand and the boys can be assigned to work under master craftsmen. Furthermore, there was an entire absence of any apprenticeship system in some industries. This is accounted for in the textile and shoe industries by the enormous advance in the use of machinery with a consequent subdivision of labor. In my own mind I divided these employers into three groups according to their several attitudes: first, a few employers that saw the importance of the problem of perpetuating skill and met it; second, a larger number of employers who shut their eyes to the solution, if not to the problem itself; and third, employers engaged in those lines of production where an apprenticeship system is impracticable.

It is noted that there may be two phases of the apprenticeship system, one a definite and complete system which may or may not be a substitute for public industrial training, depending upon the nature of the industry and the personal equation of the employer; the other, an indefinite and incomplete system which does not fulfill the obligations essential to a properly conducted apprenticeship course—obligations which may be impossible to fulfill owing to the differentiation of labor or to the lack of willingness of employers to give definite instruction.

A modern system.

The General Electric Company at West Lynn, Massachusetts, has a system of apprenticeship which is worthy of study, not only because it is one of the best representatives of several recent attempts to maintain schools in the factory itself; but also because of the important bearing similar schemes may have on public industrial training. Its courses in machine shop practice, tool making, pattern making, and foundry work, are open to boys sixteen years of age who have had a grammar school education. Four years of apprenticeship service is required, with a trial period of two months. The apprentices are paid nine cents per hour the first year, twelve cents the second, fourteen cents the third year and sixteen and one-half

cents the fourth year. A cash bonus of one hundred dollars is given at the completion of the course. Graduates of high schools, or those who have completed a three years' course in such schools, may have their apprenticeship period reduced one year, beginning at nine cents an hour the first year, receiving fourteen cents the second year and sixteen and one-half cents the third year.

Courses in bookwork are provided which are intended to give the apprentices a better understanding of machines and machine parts through making them acquainted with scientific problems and calculations connected with reading mechanical drawings and designing auxiliary tools needed in modern manufacture. The school sessions are held during the working hours, and apprentices are paid the same wages which they would receive if they were working at the bench. The course of study comprises arithmetic, elementary algebra, mensuration, elementary trigonometry, elements of machines, power transmission, strength of materials, mechanism, elementary electricity, mechanical drawing, machine design, and jig and fixture design. About one-fifth of the apprentices are at school at one time, and the services of one man are required to give them the academic instruction. The plan of paying the boys while receiving this education makes them feel the importance of it, as well as offers an inducement for those who

might otherwise not be willing to obtain it at the sacrifice of wages.

School in the factory.

The schoolroom teacher just referred to is a man who has had engineering experience, with all the pedagogical qualities of a leader of boys. He is acquainted with the shop requirements, and knows how to adapt theoretical school training to the educational needs of the machine trades. The concrete applications of science and mathematics are carefully selected from actual occurrences in the factory. This has the double advantage of initiating the apprentice into the technicalities of the business, making him acquainted with the various kinds of apparatus manufactured and the different materials used, and at the same time, familiarizing him with the solution of the same sort of problems which he will later on meet as journeyman and foreman. Mechanical drawing is not taught for the purpose of developing draftsmen but as a means of teaching the designing of tools, jigs and fixtures needed for manufacturing on a large scale. The boys are taught to sketch out special tools, jigs and fixtures which may be required from time to time for labor saving devices. The purpose is not to execute fine drawings, but rather to have the boy acquire the habit of sketching quickly for immediate use in tool making. Ex-

aminations in school work are held frequently during the year, and a final examination at the end of the course determines, to some extent, the standing of the apprentice and the wages which the company considers commensurate with his value as a journeyman.

Apprentice vs. foreman.

Ordinarily, as has been pointed out, there is a natural conflict in the shops between the purpose of the apprentice and the foreman. The boy comes for shop training and he wants to procure all possible information in the shortest time and desires a variety of work in one department and an opportunity to work in all departments. On the other hand, the foreman, representing the company, strives for economy, for cheapness of production, and he can better further his ends by keeping the apprentice on one class of work and in one department for a long time. Few foremen combine a legitimate care of their own interests with a proper appreciation of the boy's objective. There is a tendency at first for the average foreman to utilize the apprentice in running errands. Later he will give him simple work at a bench, such as chiseling and plain filing, or the cleaning of small castings or possibly assisting the stock keeper in giving out small tools and materials; but he holds off from giving him defi-

nite instruction in the trade itself. Obviously, there is a certain value in this method, for it familiarizes a boy with factory life and system, accustoms him to its atmosphere and gives him an elementary knowledge of his trade, but after a while any further expenditure of time gradually becomes more and more disproportionate to additional advantage gained. Bright, ambitious boys realize when this point is reached, and begin to press the foreman for a higher grade of work, especially for the opportunity to work at some machine. The apprentice pushes himself into the foreground in order that he may learn different classes of work, but the foreman is usually slow to respond to his appeal. The boy is between two millstones, for if he is inefficient at some particular work, he should be held at that work for improvement, and on the other hand, if he is efficient, the foreman is likely to keep him for an undue length of time in order to get the greatest commercial advantage out of the boy's work.

Remedying the evil.

The General Electric Company in the scheme outlined in a preceding paragraph has attempted to avoid this sort of exploitation of boys and to equalize the opportunities for all apprentices by affording them during the first part of their course, expert instruction in the practical work of

the trade, through the "apprentice training room," which simply means that a portion of the factory equipment has been set aside for the special use of apprentices. Here the boys are instructed in shop practice by a master mechanic who possesses ability and patience. During the trial period he studies their moral and mental makeup and their native ability to learn a chosen trade. Through such a training room the best and most efficient methods of shop production can be instilled in them, as they are apart from other workmen who may express hostility towards them by hampering their work or by refusing to teach the fine points of the trade. One instance will serve to illustrate this point. A few years ago a high speed cutting steel was introduced in the works. It made possible a greater amount of production within a given time. The older workmen, imbued with the traditional performance of former cutting tools, did not take kindly to the new methods and naturally would make no attempt to increase the cutting speed. If beginners had been working near them the latter would have caught the same spirit, but by separating the two, the company was able to bring up the boys to the latest methods. In addition the apprentices act as assistant instructors and teach other boys. The company considers that there is educational value in having an apprentice, who

has thoroughly learned a certain operation, impart that knowledge to a new apprentice before he is taught another operation. In this way apprentices are pupils to-day and teachers to-morrow. This develops in the apprentice the faculty to instruct, and brings out the best efforts of the individual and prepares the boy for the duties of foreman. At the same time it saves the company the cost of extra instructors. The latter is probably the real reason for this innovation. All production of the training room is of commercial value. The psychological value of commercial work is of great importance. It takes a boy out of the sphere of theory and into that of practice. It clinches his interest by making him realize that the product of his work is to be a part of some useful machine. Again, the company has its eye on the main chance, and fortunately it is able to combine business sagacity with sound pedagogy.

The result.

After the students have spent from one and one-half to two and one-half years in the training room they are transferred to regular departments of the works where they finish the remainder of their apprenticeship. Here they have an opportunity to specialize in die making, tool making, or laying out of machine work. They are

placed under the direct charge and discipline of the respective shop foremen.

The number who remain in the service of the company is fairly satisfactory. Naturally, the company encourages this procedure. The temptation of the graduate apprentice, with $100 in his pocket, to see something of the world is very great but a considerable number of those who leave, after seeking employment elsewhere, return as journeymen.

Another phase.

A development of the same idea and one which promises to be most important in railroad circles, is the apprenticeship system introduced upon the New York Central lines. For years the railroads have been taking graduates of engineering colleges and bringing them up to the business of railroad management. But a general feeling has been growing that railroads must do more than train college graduates for positions of responsibility. In the words of Mr. George M. Basford, of the American Locomotive Company: "It is well to provide for the college man by taking him into the shop. It is, however, a mistake more serious than most of us now realize, to provide for them unless we have previously put our shop recruiting system for the workmen—the men who do our work—upon a proper basis.

From every standpoint, the college graduate apprenticeship is wrong unless based upon, and preceded by a proper recruiting system. If we have a proper regular apprenticeship system for the workers, we have a moral right to deal with college graduate apprenticeship. If we have not such a system, we have no such right, and we are making an error for which we shall in time pay dearly. A warning is evidently needed lest we build our pyramid upon its apex. While we stand in need of captains and a few subordinate officers, we stand in greater need of an intelligent rank and file. In developing the first class, let us not kill the second. It is from the rank and file that we always have developed leaders, and always will. We shall suffer in the long run by any policy which tends in any way to discourage ambition in the large class of men upon whom we must rely. The best we can do for an industrial organization, and for everyone who enters it, is to put recruits upon an actual, rather than an artificial footing, allowing everyone to make his place in the organization in competition with everybody else."

This is a sound doctrine fittingly spoken and should have been heeded long ago by all employers of labor. Mr. Basford brought forward a plan of training the rank and file at a meeting of the Master Mechanics Association of American

Railways, and soon after, the New York Central inaugurated its system of shop training for young apprentices. As a result there have been established schools at ten points on this and the affiliated lines.

These schools provide for the close supervision and instruction of the apprentices in the shop by an apprentice instructor. They are conducted by the company during working hours, the apprentice being paid for attendance. Mechanical drawing is taught in a practical way. A course of problems has been prepared and carefully arranged to suit the needs of the apprentices, and the pupils are expected to work them out during their own time.

The method of teaching differs from the ordinary in the following points: text-books are not an essential part of the plan; there is no subdivision into subjects; all principles are clothed in problem form; there is no arbitrary standard of the amount of ground to be covered and no examinations are held. The progress of the apprentice depends upon the close personal touch maintained between him and the instructor. He is under the foreman, as heretofore, but the foreman is relieved of the technical instruction of the apprentice. The classes meet twice a week for the first two hours in the morning, when the boys are bright and fresh and able to do their best

work. The average number in a class is seventeen. The total number of apprentices in the ten schools thus far established is about five hundred. Moreover, shop schedules for apprentices are followed, thus insuring a thorough training in the trade and giving the necessary amount of variety. This is an essential point for there must be shop progress as well as definite and progressive bookwork. The drawing and problem courses are arranged to allow each apprentice to proceed as rapidly as he desires. The management reports that the apprentices, as a rule, appreciate the privileges thus accorded them, and states that the company secures a better class of boys for apprenticeship; apprentices, because they understand the shop directions, perform their duties with greater efficiency; there is an increased output, with less spoiled work on the part of beginners.

Well defined advantages.

Advocates of public industrial training can learn a good deal by studying the methods of instruction used in a first-class factory school, for there are certain well defined advantages of a proper system of apprenticeship over public trade schools. At least, the apprenticeship system may be a mighty competitor if properly handled. But so few shops have any adequate

scheme of instruction that it will be a long time before any clash of opinions of the relative merits need occur, and the chapter on trade schools makes clear the advantage of public trade training over the average so-called apprenticeship system. For the sake of argument we will suppose that every apprenticeship system offers progressive instruction in shop practice and its related bookwork. Let us look into the advantages of such a method of training over public trade schools.

First, it assures the boy a practical training in actual shop processes and methods and thus gives him a good start at the completion of the term of apprenticeship. The employer knows the apprentice even before his time has expired and may have his eye on him for promotion. The apprentice being familiar with the special conditions pertaining to the particular shop, is ready to step right into his job.

Second, the apprenticeship system gives the boy a chance to earn as well as learn. This point has been brought out in the description of the coöperative system and it has an important bearing on the whole question of trade schools, for the class of boys to which industrial education appeals is usually made up of those who cannot afford to spend four years in a trade school. Moreover, if the trade schools over-em-

phasize academic work they will not stay. At the same time no apprenticeship system, good or bad, with which I am familiar, ever makes the last mentioned mistake, for the employer makes his profit not on the bookwork but on the amount of shopwork the boy does. Undoubtedly it is extremely difficult to hold the boy in a trade school. The call of the almighty dollar appeals to him as it does to his elders. Even the one year course in the North End Union Printing School in Boston has difficulty in holding the boys for they prefer to go directly into the printing office where they are paid for their time.

Third, it makes the boy feel that he is doing something worth while since he is a part of a great industrial game where he is making things to sell. The pile of castings becomes the rows of finished machines and he has had his share in the output.

Fourth, it appeals to the parents as being very practical, not merely because the boy is self-supporting, but also because the father learned his trade in the shop and cannot see how it can be learned in any other way. Fathers say to their boys, "If you really want to learn a trade you must come with me into the shop. That was the way I got mine, and what was good enough for me is best for you."

Fifth, the system of apprenticing boys appeals

to the employer, for he can train boys in processes and methods peculiar to his industry, to say nothing about personal idiosyncrasies. Moreover, the employer can afford to teach the green boy, as he can make a profit on him at the beginning, while a trade school graduate would want all he was worth, at the start, and perhaps more too. We all know that employers make a profit on their apprentices when they have a well thought out system of training. Some confess it; others show it by their action during dull seasons when they discharge experienced workmen but still retain their apprentices. E. P. Bullard, a manufacturer of Bridgeport, Connecticut, with years of experience with apprentices, was asked whether apprenticeship systems pay the employer? His reply was "Most emphatically, *yes*. Many successful concerns who have had apprenticeship systems in operation for a period of years are unanimous in their statements that apprenticeship systems do pay. If properly instructed and intelligently directed, the employment of apprentices is more profitable than the employment of the so-called skilled workman who has been available in the past. Apprentices pay as producers during their term of service; as skilled journeymen when they have completed their course; and as intelligent foremen and executives later."

Sixth, it appeals to other workingmen, for it

starts the boy at the bottom round of the industrial ladder and through a natural process of the survival of the fittest, eliminates the undesirable element. Especially is this true if the trade school gives its graduates an impression that they are predestined to be foremen, for that is bound to cause hard feelings on the part of shop-trained workmen. It is of tremendous social and industrial importance that our leaders should rise from the ranks if we are to get the best results from the mass of industrial workers. If the apprentice, whether he be a graduate of a trade school or attends a factory school, can advance through deserved promotions to a position of responsibility, the personal contact which he will have with the rank and file will leaven the entire mass. It is common knowledge that foremen and superintendents who have risen from apprentices, get along better with those under them for the simple reason that they appreciate the point of view of the other fellow.

Facing the truth.

Not all apprenticeship systems are conducted in such a broad and comprehensive manner as the two which have been outlined. As has already been implied, some apprenticeship agreements pretend to teach a trade, but make no definite provision for carrying it out. John Mitchell

states it fairly: "While in certain trades unmodified by the advent of machinery, apprenticeship may still persist in its oldtime form, in most cases the system of indenturing boys for a long period must be definitely surrendered. The boys themselves are no longer willing to serve this protracted apprenticeship, and, as a general rule, no opportunity is afforded in the great industrial establishments of to-day for a youth to acquire a thorough knowledge of the trade even when such a knowledge would be necessary or advantageous to him." Some of the objectionable features of many of the so-called apprenticeship systems have already been touched upon, but they ought to be collected at this place for the purpose of comparison with the definite and genuine appenticeship systems. They may be summed up as follows:

First, beginners are hired by the employment department without any special care as to their selection. This is especially true of large plants. They are then assigned to shop foremen who utilize them as errand boys and expect them to sweep floors and pile castings. This is done to try them out, but in reality it does nothing more than test their ability to hold their job. Of course, neatness, promptness and politeness are factors, but all these qualities could just as well be tried out by assignment to definite or machine work, or to the tool or stock room. While

moral qualities have their value, they do not necessarily mean that the boy has any mechanical ability.

Second, the ideals of the foreman and the apprentice are at cross purposes. The apprentice desires to learn a trade. The foreman wants to cheapen the cost of production; consequently, there is a tendency to exploit the boy. Often the apprentice is placed under the direct charge of a journeyman who is on piece work and the boy merely acts as a helper. In some shops the workmen make it a practice of standing in with the foreman in order to secure the services of boys to aid them in running some automatic machine, the journeyman taking the contract for a given line of work and paying out of his own pocket the wages of his young helper.

Third, once in awhile an apprentice will be assigned to a department where there are a few narrow minded workmen, who will not show him anything. Fortunately, this is not a common occurrence, for most journeymen, if they have the time and patience, will stop to help the boy. I have often been struck by the good feeling between the two, and when there is a lack of cordiality it is usually because the employer is trying to supplant journeymen by employing too many boys. Of course, some of the older men who have served a long apprenticeship say, "Let

the kid pick it up as I did." I remember one shop in a New England city, where I saw the apprentice standing idly by during an intricate machine operation. I asked the workman why he did not tell the young apprentice what the process was all about and he replied, "What do you think I am—a teacher?"

Fourth, the majority of apprenticeship courses do not provide for bookwork, which should be a supplementary part of every boy's trade training. A trade cannot be properly learned unless he knows the mathematics, mechanics and business methods which go with it. This instruction may be given in the company's works or outside, but in both cases, must be definite and progressive. The regular trade school will always be a successful competitor unless the apprenticeship system provides some sort of definite academic work.

Trade unions and apprenticeship.

The trade unions have sometimes been charged by their opponents with the failure of the apprenticeship system. Statistical information goes to show that this is true in but a few trades, and that trade union restriction of apprentices is but a slight factor in this problem. John Mitchell declares: "As a matter of fact, it is usually found that in the cases in which American trade

unions actually determine the number of apprentices, the employers in the trade are unwilling to take on as many apprentices as the union permits." One personal experience will illustrate this point. Several years ago I dropped into the office of a manufacturer to inquire about the apprenticeship system. Immediately he commenced to berate the union regulations, stating that he could not employ all the apprentices he needed. I found that by the union rules he was entitled to one operative for every eight journeymen in his employ. He had eighty-two men on his payroll. This would provide for ten apprentices. He actually had but four in the works.

A development occasioning apprehension.

There is a form of special apprenticeship gradually creeping into the machine trades that is liable to deceive those who look upon all apprenticeship systems as being alike. This system assumes that if the great majority of workmen are to be specialists, then the apprenticeship course should take cognizance of this fact and should train men for the work they are to do. Advocates of this system say that it is a condition, and not a theory, which confronts them. They state that it is difficult to obtain boys for

the general shop training courses for the rate of wage which can be offered, because when boys are transferred from one department to another, there is a loss of efficiency for the time being, so far as output is concerned. They state, moreover, that these departments are so large in themselves and have so many operations and processes, that they can easily employ nearly all the capacity of the boy for the full term of indenture. Under the special apprenticeship plan the boy attains a good rate of efficiency in a comparatively short time, so that departmental instruction is reflected in an immediately increased efficiency, and the plan is furthered because it is found to be immediately profitable. There is a short trial period, and then indenture in *one* of the eleven departments of turning, vertical boring mill, horizontal boring mill, planing, milling, drilling, grinding, erecting, turret, vise, scraping. For example, in the planing course the agreement reads that the apprentice is to spend one and one-half years, of two thousand nine hundred hours a year, in this department, being paid twelve cents an hour the first six months, fourteen cents the second six months, and sixteen cents the third six months. Regular apprenticeship system course may be taken afterwards if boy elects it.

A discouraging note.

That not all firms find the path of apprenticeship training easy is evident from the following letter by a well known machine tool builder, who describes the difficulties of training apprentices under present conditions in many American works. He says, "We do not have any apprentices in our works, having discontinued this branch of our help some two or three years ago, for the following reasons: first, our experience has been that there are only about forty per cent of our boys that ever completed their course, the majority leaving at about the beginning, or during the second year, the principal reason being the inducements offered by other shops, many of them paying full wages to apprentices who had worked this length of time in our works. Second, our term of apprenticeship was four years, and in order to satisfy these boys we found that it was necessary to change them about at least once in six months. In actual practice we found that we were running a kindergarten, for no sooner had they become sufficiently accurate and practical to turn out work on the machine which they were operating, and oftentimes before they were competent, they were dissatisfied if not transferred to another machine of the same type or one of different type. Third, we find that in our business it is much more practical to secure the

services of intelligent laboring men from twenty to thirty-five years of age. They enter our service on a three-year contract. The first year we pay them practically what they would be able to earn at common labor, advancing them each year until their term is completed. Their contracts call for continual service on one line of machines or work; that is, if a man is started in at lathe work, he is advanced from one class of lathe work to another as rapidly as his ability will permit; the same is true with regard to planer work. With this system we are able to keep our machines in constant operation and usually we get practical, reliable help. In machine tool building much greater accuracy is required than in the ordinary lines of mechanical work and the average apprentice does not attain sufficient accuracy and experience, nor has he ability to turn out work in paying quantities, when his experience is limited to six months, or when he is changed from one machine or class of work to another; consequently, he cannot turn out enough work in paying quantities for us to permit him to use a high-priced machine on which to get his experience."

The bearing upon industrial education.

From all that has been said, it is evident that some industries have great possibilities in their

own works for giving the proper industrial training to employees, while other industries must look to public industrial and trade training to meet their needs for skilled and intelligent workers. It is well to bear in mind that industrial education must be adjusted to the varied requirements of such industries, and in some instances, must actually supply the demand for skilled workmen as far as any public school system can supply it. In other cases it may supplement the training in a school with the training in the shop, or it may have as its sole function the right sort of preparation for the practical and efficient training received in an excellent apprenticeship system. In the first instance, it means public trade schools; in the second, coöperative or continuation schools, both day and evening; and in the third, preparatory industrial training up to the age of sixteen.

From fourteen to sixteen.

In those communities where a first class apprenticeship system exists, the value of establishing a local trade school for the boy of sixteen may be questioned. But there is no doubt of the value of general industrial training as a definite preparation for the special shop apprentice training which has been described. Boys who are going to enter the shops must be kept in school until

they are sixteen. The unwillingness of manufacturers to employ a boy until he is sixteen or seventeen and has reached the age of discretion as well as of more physical maturity, makes it imperative that public education provide facilities for meeting this condition. The recent development of the special apprenticeship system in the machine tool builders trade only emphasizes the need for general industrial training. The tendency of modern industry is towards specialization. There is no getting away from the fact. The rapid increase in the number of divisions of the various industries into related industries, the ever-increasing subdivision of processes and operations within a single department of the industry, means that no worker can master the whole of an industry unless extraordinary effort is made either by trade school or manufacturers to counteract through sound vocational training the prevailing tendency.

The action of the National Tool Builders' Association in boldly stating that they expect to train specialists, will do much in calling the attention of the public to the necessity for broad industrial training before the age of seventeen. If the shop tendency of training specialists is likely to continue—and there is no reason to think that it will be different—it means that the boy must receive some all-around academic and

hand training before he enters the industry, else it will be impossible for him to rise above the conditions imposed by the industrial organization. It is the common experience that few boys who enter upon a special apprenticeship system ever take up the full apprenticeship course afterward. The pay at the end of the special apprenticeship service is too large in proportion to that which he would receive if he started over again in another department, to make it a sufficient inducement for him to continue a scheme of training which will make him a master of the details of all the branches of his trade.

The lesson to learn.

The lesson to be drawn from a study of the apprenticeship system is perfectly clear. If the more progressive manufacturers are ready to provide trade teaching in their own factories after the boy is sixteen, then the public school must provide the right sort of industrial training before he reaches that age. These men say that the majority of the applicants for the apprenticeship course have left school as soon as the law allowed, and that they have been in all sorts of work, that they have not improved mentally or morally and have forgotten many of the precepts taught in school. Again and again they have stated that they would like to have boys

better prepared in general intelligence and in hand training, with a better mental grasp of industrialism, a better understanding of practical mathematics and simple mechanical drawing.

The excellent methods of teaching in the factory schools the shop problems relating to the formal subjects of arithmetic, algebra, geometry, mechanics and chemistry, ought to have a great influence on the methods of instruction in the public industrial schools. It is a revelation to see the manner of approach of the applications of theory to practice; each example being a concrete illustration of some mechanical principle of the daily shop practice. Public school teachers well might study the methods of instruction adopted by the instructors of the New York Central Lines. Instead of working from theory to practice, the pupils work from practice to theory. They take an old steam pump, run it by compressed air in the school-room, and let the apprentices see the way it works, take it apart and examine into the valve motion, make drawings of the various parts, calculate the cubical contents of the cylinders, study the various mechanisms, and then go out into the shop and grind the valves. In short, starting with the pump, they work out by concrete applications the subjects of arithmetic, geometry, mechanical drawing and mechanics.

It must not be assumed that a trade or industrial school is the only agency by which an increased amount of skill can be secured. In the opinion of all educators who have given the matter any thought, the apprenticeship system, in its modern form, must be reckoned with as a powerful element. The aims and purposes of all methods, whether they be worked out in a trade school, industrial school, or apprenticeship system, are the same, each to be applied and developed in accordance with the conditions of local communities and their industries. The broad minded individual must reckon with all these expressions of industrial training. Narrowness of vision, personal jealousy, and special advocacy of one system or another will be prejudicial to furthering a sane solution of the problem of education of industrial workers.

IX

SUPPLEMENTAL EDUCATION IN ITS RELATION TO INDUSTRY

IN an ideal state there would be no distinct line of cleavage between periods of formal education and wage-earning work. Our young men and women should be workers, and yet always students with enough time to spare from both for recreation and full enjoyment of life. While it may be visionary to hope that some day there will be this close connection between school and life, everyone must regret at least that the majority of our people look upon education as a schooling occupying the first few years of life, during which they do little or no work, and this schooling over, are ready to enter the industrial world with few if any opportunities for further study, save those which the exceptionally ambitious man or woman will create for himself.

Educational field.

What are the ways of supplementing school education open to the youth who has left school

as soon as he passed the age of compulsory attendance? To define clearly the nature of supplemental education, the three main divisions of the whole field of education may be indicated as follows:

First, fundamental education, or that which gives a general training for life's work. Under this head would come the so-called common schools, academies and colleges—all schools whose work is conducted for the student class.

Second, incidental education, or that acquired when the student or worker meets conditions which differ from those of the school-room, an experience gained as he solves the problems and performs the duties of daily life. While the education of experience has its disciplinary value, it is not the ideal means to come by a trade or profession.

Third, supplemental education, that which makes up deficiencies in one's schooling, or furnishes the necessary complement to one's incidental education. It is neither an imitation nor a substitute for fundamental or incidental education. It supplies something which the youth has failed to get in regular school work, and is failing to get in active life. *Supplemental* are those institutions other than day schools, which serve primarily those who do not belong to the student class.

Agencies of supplemental education.

Among the most fruitful agencies of supplemental education are reading rooms and libraries, especially those which suggest and direct courses of reading. Several evening institutes in this country, carrying on highly developed industrial work, of which Mechanics Institute in New York is a notable example, are the outcome of workingmen's institutes originally chartered to provide the self-improvement of their members through technical libraries. Public libraries are endeavoring through special lists of technical journals and books, to reach the industrial workers. Springfield, Massachusetts, and Newark, New Jersey, are very successful in their library extension work, selecting and arranging these books so as to make them accessible and helpful in connection with the daily life and work of the mechanic.

A noteworthy indication of a widespread desire for supplemental instruction is the remarkable growth of correspondence schools in the last decade. Over one and a quarter million students have been enrolled in one school alone. The great majority of these are employed in the industries. Courses are offered in every conceivable subject, and reach every point where the mail is delivered. However, according to the data furnished by the manager of one of the larg-

est schools, only 2.6 per cent of the enrolled students ever complete an entire course. This fact must not be used against this school or the work it is doing, as many of its members subscribe to its courses with no intention of completing the course, retaining the books for future reference after having received the necessary help in some one branch of instruction.

The following reasons why students do not complete their courses are given by the promoters of these schools. They enroll for the purpose of studying certain operations and do not care to complete a course, provided they are able to pass some civil service examination. Some buy the books without intending to hand in papers, while others do not possess sufficient grit and determination to persist, especially when they receive no special encouragement. Some are obliged to stop studying on account of being forced to work long hours. A number who enroll think they can study and find they cannot, or else they are ignorant of the way to start in on the subject. A few enroll because their friends are enrolled and because it is the proper thing to do. Others do well during the winter and early spring but lay aside their enthusiasm when the warm weather comes. There is no way of compelling the students to study, for the school cannot threaten them with suspension or expulsion.

Much has been said for and against these schools. Two facts are worthy of attention. First, hundreds of past students testify to the value of the instruction that they have received. Many employers also speak of its advantages to them, personally. Second, with practical, up-to-date teaching in our evening schools, there can be no question of the advantage of classroom instruction over correspondence instruction. The inspiration of the teacher, and contact with fellow students give a motive force beyond that imparted by an impersonal teacher commenting on a letter of inquiry or sending out a typewritten lesson to be mastered by detached and irregular students and projecting encouragement, instruction and counsel by long distance communications.

Other powerful factors in supplemental work are the educational classes of the Young Men's Christian Association, Young Women's Christian Association, city evening schools, People's Institutes, Chautauqua courses, University Extension lectures, vacation schools, etc. In these an effort is made to meet the members' current needs and interests by giving technical instruction to those who wish to advance in their present occupations or to fit themselves for higher positions, and by giving cultural courses to those who wish to broaden their outlook.

Supplemental education has thus a large and important field, and touches life on all sides. It often awakens a sense of intellectual need and is the beginning of an appreciation of culture. Our evening high schools are doing good work along this line, particularly in offering courses in history, English, the sciences and languages. They enable one to investigate his special interests, discover his natural bent, and measure his capacities. Likewise the evening vocational courses, both industrial and commercial, are aiding young men and women in this respect.

Making up deficiencies.

Supplemental education provides facilities for making up deficiencies in one's elementary education. The elementary evening school work has always fulfilled its greatest mission with this class of students.

In many cities the evening schools have recently been filled with the foreign born who have had to master our language. Adults have been grouped with minors in classes in reading, writing and arithmetic, to the detriment of the work. I have been chagrined at the lack of proper perspective on the part of teachers when I have visited evening schools where mature foreigners have been forced to learn the English language from primers adapted to small children. It is

pathetic to see grown men reading such sentences as "I see the cat;" "Can the dog catch the cat?" and such other dribble. Why not a book which treats in an elementary manner of the civic and industrial duties of our future citizens? For illustration, "I see the city hall; it is the seat of our local government;" "I must buy flour at the store," etc. Every effort should be made to reduce the embarrassment which many of the adults feel at having to be instructed after passing the usual school age by separating the adults from the younger members of the class. Because of the extreme self-consciousness of the mature non-student class when endeavoring to make up their deficiencies or working on unusual lines of effort, there arises the necessity for careful shaping of administrative plans in advertising, reports and current conduct of the work to avoid making any attendant conspicuous as a delinquent or as a belated or emergency student. It is a fact that most of our evening school work has never gone beyond carrying out the requirements of state laws relating to compulsory evening attendance for those who cannot read and write.

Personal advancement.

Often its special appeal is in offering to fit for improved service or advancement in the line of

one's present employment. This is the great field for vocational work in the evening school and the subject will be amplified later in this chapter. Again, through the educational occupation of his leisure hours, it aids one who is unfortunately placed to gain successful entrance into an activity for which he is better adapted. Except through supplemental study there is no way for many young men and women to fit themselves to occupy a higher round on the economic ladder. It is a pity to see so many men and women doing service which offers no opportunity for advancement. A telegraph, messenger or elevator boy can live on a boy's pay, but a self-supporting man requires a man's pay and should be doing a man's work. The community should see that he does it by fitting him to do it.

Principles to be established.

According to Walter M. Wood, director of educational activities in the Chicago Young Men's Christian Association, there are certain fundamental principles to be followed in the conduct of evening school work. Some are enumerated here. In so far as they apply to industrial activities, they will be given special treatment later.

First, it must deal with two rather distinct classes: (a) students proper, constituting the small minority who seek a general education,

with definite student purpose, but
rather unusual personal conditions;
student class, constituting the large
who, by suggestion or counsel, seek ed
help in the solution of some present proble
fitting for some special service.

Second, the scheme of work offered must make the various features elective to a maximum degree. While the ideas of the school men can and must prevail in the day schools, the individual notions of a mature student will dominate his selection of subjects in the evening schools.

Third, the work must be flexible enough in its adaptation to meet individual, special and even transient needs and conditions.

Fourth, the subjects must be presented in small and varied units.

Fifth, the various units of work must be so scheduled that sequential arrangement in courses is possible when desired. It should be even encouraged.

Sixth, all forms of work must glow with the recreative element, both in subject-matter and treatment.

Seventh, the work must, in many of its rudimentary forms, aim at suggestion and inspiration, rather than complete or thorough training.

Eighth, the work must seek to increase the student's capacity to live efficiently and largely,

rather than to promote the accumulation of knowledge or the development of scholastic ability.

Ninth, much stress must be laid on the teaching itself. By suggestion and personal coöperation, the teacher can awaken and develop to a wonderful degree, a mind rendered mentally inactive by disassociation with educational forces.

Tenth, the work must have its own distinct ideals, methods and estimates of value, based upon the current conditions and individual needs of the non-student class rather than on regular school standards which are primarily applicable to the student class.

On an independent basis.

As a practical expedient in the promotion of evening elementary and high schools, and the more recent supplemental movements such as evening vocational schools, it is usually wise in matters of administration to keep the two separate and distinct. This provides against the necessarily irregular, special and frequently uncredited work of the supplemental movement discounting or handicapping the conduct of the necessarily systematic, aggressive and credited work of the older educational institutions. On the other hand, it protects the vocational school from being restricted in its liberty of adaptation or converted into a mere auxiliary feeder to some school.

Association with daily life.

Its methods of administration must be adapted to meet the peculiar conditions and personal attitudes of those to be served. The desirable locations for such work are in the natural assembling places of working people, especially during their leisure hours, to as great a degree as possible making the educational effort in which they participate a natural adjunct to their everyday life, instead of a separate and distinct enterprise. This consideration has been the cause of placing libraries, reading rooms, lectures and class work in stores and factories, instead of congesting all these features in distinct places set apart in the community as strictly educational centers. It may surprise some to learn that the most successful educational work for foreigners has been given in the halls commonly used by these people for dancing purposes. Evening schools for working people must be near their homes, or near the factories and stores in which they work. In some cities one will find evening schools in factories in rooms set apart for the purpose. The Drop Forging Company, Utica, New York, has established an educational center in its works. Some department stores in Chicago, New York and Boston carry on educational work in the early hours of the working day before the bargain seekers arrive. It is easier for teachers to

go to the working places than it is for the workers to travel to the school. The eagerness with which the more ambitious seek supplemental education is shown by the fact that in Chicago and New York, some students enrolled in technical night courses travel twenty-five miles three evenings a week for the sake of attending classes. Some advantage is also gained by offering the educational features in connection with other privileges, physical or social, the continued interest of many people being dependent upon identification with an associated group of varied privileges, offering not only self-improvement, but recreation. The educational work of the Young Men's Christian Association perhaps best illustrates this point, for many of its students use the reading rooms and lunch counter before the class meets and join in the gymnasium games at the close of the lesson. There is too much tendency for people to seek recreation independent of instruction. The social centers which are being introduced in some cities are an attempt to combine wholesome recreation and companionship with self-improvement. May we have more of them.

Contact with outside world.

In order to maintain the closest possible working contact with the employed classes it is necessary to have in the leadership of supplemental

educational movements a number of individuals representative of the various walks of life. This applies particularly to the vocational courses. Advisory boards, made up of practical tradesmen, should assist the regular educational authorities in laying out the courses and in seeing that the results accomplished are in accord with the best practice. The active participation of these representatives will insure that the movement will be constantly attuned to current conditions and needs, and saved from being either distorted in the hands of fanatics, or crystallized into an arbitrary educational system entirely dominated by professional schoolmasters. There is need, as in perhaps no other form of educational work, for liberally trained, energetic and tactful supervision, for most supplemental educational movements must be launched and maintained by sheer force of inducement and personal leadership, the work being practically injected into situations which reveal no conscious or intelligent demand. The supervisor of such movements must be not only thoroughly sympathetic with the purposes and activities of fundamental educational institutions working especially for the student class, but must also be keenly sensitive to the educational needs and possibilities of the great non-school population. The remarkable growth and success of the even-

ing lecture courses given under the auspices of the Board of Education of New York City and supervised by Dr. H. M. Leipziger, who devotes his whole time to such work, is convincing evidence of the value of expert supervision. In no less degree is this fact brought out in the work of Cooper Union, New York City; Pratt Evening Institute, Brooklyn, N. Y.; Spring Garden Evening Institute, Philadelphia, Pa.; and Lewis Evening Technical Institute, Chicago, Ill., with their thousands of enrolled students and hundreds of graduates who have received instruction in courses as definitely organized and managed as are any schools conducted during the daytime.

Credit for the work done.

Since supplemental educational movements deal mainly with a different class and have different objects in view from the schools proper, it will be found expedient that not only courses of study, and frequently methods of treatment be distinctive, but also where formal recognition or credits are given for work done, that these credits shall also be distinctive, the forms of certificates being sufficiently detailed and specific to avoid any misjudgment of value, or confusion with the credits for systematic student work in fundamental educational institutions. Experience in evening trade school work has shown the need of making

the school certificate very specific in its character. It is not sufficient to state that the student has satisfactorily pursued a course in machine shop practice or that he has taken a course in mechanical drawing, for the student is apt to use this certificate in obtaining a position and after he has been at work for a time the employer discovers that the young man is not qualified to do the required work for he may have learned only to run a lathe in the school and perhaps is absolutely unqualified to handle a milling machine. Naturally, this brings discredit upon the school. A better plan would be to have the school certificate state that the young man has pursued a given course for a certain number of hours and that he has learned to adjust and run certain specific machines, or in the case of a course in drafting, that he is familiar with orthographic projection and simple working drawings. Care used in specifying what the student can do will avoid embarrassment both to the school and student. However, such specific credits should be readily convertible into a substantial and dignified form of school diploma. While intrinsically a diploma may be nothing but a bit of paper, it often means as much to an evening school student as to a college graduate. At the same time, the majority of those enrolled in supplemental education give little thought to formal credits,

being satisfied with the personal returns from the privileges enjoyed.

Evening schools for industrial workers.

Primarily this chapter is for the purpose of calling attention to the general problem of evening schools for the industrial workers. It is intended to emphasize the importance of adapting evening instruction to the needs of modern industry and its workers, and to bring out certain fundamental points which must be considered if such instruction in our public schools is to be more efficient. This preliminary survey of the whole field of supplemental education has been made in order to bring out the growing importance of the movement. An important educational move in the immediate future will be in the direction of improving the instruction of evening schools and adapting them to the needs of industrial workers. Undoubtedly the methods of these schools should be recast. They should adapt themselves to modern industrial conditions, and through proper instruction in practical subjects, touch more closely the economic life of the times. The students in these schools have already received a more or less formal education in the public schools. They are receiving in their daily work incidental industrial experience, and have learned from this thorough but expensive teacher, that

they are deficient in some lines; hence, this endeavor, outside of their working hours, to fit themselves for definite lines of activity.

Vital needs.

There are certain vital needs in the organization and methods of conducting evening industrial improvement schools. In common with all supplemental education, voluntarily sought, these schools, as has already been implied, deal definitely with two rather distinct classes. The first are those who are naturally students and seek educational advantages in the advanced lines of mathematics, mechanics, chemistry, etc., with a definite purpose. The school for industrial foremen conducted under the auspices of the Massachusetts Institute of Technology, likewise the Lewis Institute of Chicago, Cooper Union of New York City, and Pratt Institute of Brooklyn, N. Y., in their applied science courses, appeal to this class of students. The second class are those who are not naturally students, who still, with a more or less definite aim, seek educational help in the solution of some present and pressing problem which involves special educational service. The latter class is concerned with shop mathematics, plan reading, shop practice, etc. Most of the academic and shop instruction in the Stuyvesant Evening School of Trades, New York City, the evening industrial

classes in Lawrence, Massachusetts, the various evening trade schools in Buffalo, New York, Springfield, Massachusetts, and similar schools, reach this group of students. The recognition of these two classes means that the courses of instruction must be of two kinds—one comparing favorably with the day school work in its general scheme; the other, the major part, differing decidedly in methods from those ordinarily pursued.

Teachers make the school.

Mention has been made of the importance of good supervision in all supplemental education. It is of even more importance that the best teachers be employed in evening industrial schools. Day school teachers are employed too much at present. These teachers may be able to meet the needs of the student class but they cannot properly teach the non-student class. To the custom of employing day school teachers must be laid much of the lack of definiteness in the planning of evening industrial school work. Obviously, it is natural for the average day school teacher to adopt for his evening instruction the regular science and mathematical text books and to use the regular outlines and methods. This is a perfectly consistent action, for few regular teachers have had opportunity to know the vital industrial needs of their students.

Now, even on the book side, the only people competent to teach in our evening industrial schools are the men and women who know the vital points of interest which concern the workers who come to the evening schools to meet definite needs from their actual contact with modern industrial and commercial life. At present the schools which are doing the most efficient work are employing practical mechanics and young engineers to teach the shopwork and bookwork. Moreover, this is a good way to discover good teaching material for the day trade schools, which suffer more or less because of a lack of practical as well as experienced teachers.

The direct appeal.

Evening school instruction must appeal to the student immediately at the beginning of his work. The subject-matter of the early lessons must satisfy the student's need as he has defined it. The success of evening instruction absolutely depends upon this principle.

For example, a young machinist has received a reprimand from his foreman because he cannot read a working drawing with sufficient skill to do properly his daily work. He enrolls in a drafting course to meet that deficiency and finds that the first two lessons are concerned with letter plates, the next three with drawing straight and

curved lines and the handling of instruments, and that the remainder of the term is to be spent on the projection of points, lines, surfaces and solids. During this time he is receiving in his daily work the same reprimands, and is therefore debating in his own mind the value of his evening instruction.

It is undoubtedly true that the drawing course here outlined is a proper one for teaching mechanical drawing to those who are to be draftsmen, but the average apprentice machinist does not see the direct application of this instruction to his work. He enrolled for a definite purpose. To be sure, it was a narrow one, but nevertheless, it had economic value to him. It would be perfectly possible to give in the first evening some elementary instruction in the reading of simple drawings; to teach him in five lessons where to look for the dimensions denoting length, breadth and thickness; to show him the principles of simple sectional drawings and to cause him to comprehend the laying out of holes for drilling.

Instead of leaving school at the end of the fifth lesson, with no instruction which appealed to him, he would have received enough in those five lessons to fit him to meet the demands of his foreman and it is more than likely that he would have remained in the drafting class to receive the more definite and thorough instruction in the

theory of mechanical drawing such as must be gained if one is fully to comprehend and cover the entire range of the subject. We have much to learn from the methods employed in training shop men to read drawings, making sketches and simple working drawings in the drafting courses given in the apprenticeship systems of the New York Central and the Erie Railroads.

Flexible courses.

It has already been stated that the various features must be elective and flexible and presented in small and varied units. Instead of presenting in a course of study the subjects of arithmetic, geometry, etc., there should be printed "arithmetic for mechanics," "arithmetic for clerks," "mechanical drawing for apprentices," etc. Where it is possible, even a finer differentiation is desirable, such as "arithmetic for plumbers," "arithmetic for errand boys," "mechanical drawings for machine tenders," etc. Not only will this presentation serve to catch the eye of the prospective student, but it will also suggest to him that special effort is to be made in the class work to help him in his daily occupation. This form of advertising is a reason for much of the success of the correspondence schools. The instruction in the various branches must be adapted to the needs of the various oc-

cupations. The terms used in the classroom must savor of the shop, office and store. Experience shows that the problem, "What is ¾ of 37½?" does not appeal so much to a clerk as the problem, "What will ¾ of a yard of cloth cost at 37½ cents a yard?" On the other hand, the latter problem does not awaken the interest of the mechanic as much as the problem involving the same operations which reads, "If a copper casting weighs 37½ pounds and specific gravity of iron is ¾ that of copper, what will the casting weigh if made of iron?"

Any evening school with an enrollment which requires the formation of more than one class in a given subject, can divide its class enrollment into at least two divisions: first, for those engaged in industrial work, and second, for those engaged in commercial work. The larger the enrollment, the finer the differentiation as based upon the daily occupations of the students. The Mechanics Institute in New York City offers nine distinct courses in drawing—carriage drafting, machine drafting, builders' drafting, etc. The same subject-matter needs different treatment for different lines of activity. For example, the course in arithmetic for the apprentices in the Fore River Shipbuilding Company at Quincy, Massachusetts, has nothing in common with the arithmetic course in the Textile School in Lud-

low, Massachusetts, except that both use the same fundamental operations. But it is doubtful if students in either school could exchange classroom work without embarrassment, and it would be absolutely out of the question for a boy well grounded in arithmetical operations but with no knowledge of either trade, to do anything with the problems of either industry.

Sequence of courses.

It is important that evening schools have a sequential arrangement of courses. The majority of such schools pay no attention to the needs of the advanced student. Economy of administration does not appear to make it worth while to make provision for him. The private schools have done much better. For example, Cooper Union of New York City has definite four-year courses, and experience shows that, while the advanced classes began with small numbers, they have gradually reached a large enrollment. If the student's transient need is well met, it will place him in a better position, only to make him feel a renewed need of self-improvement. Probably the greatest service can be done such a student in meeting his need as he sees it; afterward he may be willing to meet the need as the teacher sees it. This means that he will return to the evening school in some subsequent year when he ought to

be given advanced work. Experience teaches that evening schools are so overcrowded in the elementary courses that these advanced students suffer through insufficient attention. If specially provided for, they might become our foremen, superintendents and managers. Not only must each school year's work be driven home and clinched, but each series of years' work be so clinched as to meet the needs of industry, which is demanding thoroughly trained men for foremanships.

Departmental system unsuitable.

The student will do better work if the instruction in the related branches of certain occupations is given under one teacher, rather than under the departmental system of specialists in each branch. The student should not elect more than two or three subjects, the major one bearing directly upon his daily work, the others somewhat related to the main one. It is this major subject which has drawn the student into the school and it is this which will keep him there if, along with it, one or two allied subjects are taught in a practical manner by the teacher of the major subject. The student will understand better the connection between these subjects because the teacher has himself a clear conception of the relationship. For instance, a machinist enrolls in

an evening school for mechanical drawing, and finds that he needs to brush up in fractions and decimals and that he needs square root in order to work out a formula for screw threads. The opportune time to teach him these topics is when the need for them arises, and none is more qualified to give the required practical instruction in such topics than a competent drawing teacher. In the Cambridge, Massachusetts, Evening Industrial School the teacher of machine shop practice devotes a portion of the time to teaching shop mathematics to his students. When large classes demand assistant teachers, these assistants should be assigned to teaching applied mathematics through individual instruction at the drawing table and benches, or else to giving instruction to small groups in an adjoining room, keeping before the mind of the student the direct connection between arithmetic and handwork. When the student has reached a place in the drafting course dealing with the subject of screw threads, it becomes necessary for him to apply some such formula as $P=0.24\sqrt{d+0.625}-0.175$ where P is the pitch of the thread and d is the diameter of the bolt. This problem involves square root and decimals. One hour of individual or small group instruction by the drawing teacher will give the student the necessary familiarity with these mathematical processes to make them sufficiently

clear to him in their application to the formula. Instead of thorough preparation in mathematics before electing mechanical drawing, it would be better to have the mechanical drawing lead the students into mathematics.

Classification by vocations.

Students must be grouped in the vocational classes according to their trade or business. The old workingman's guilds were founded for the purpose of social intercourse and mental stimulus. Each trade had its own guild. The daily trade experiences of each member became the property of all members. Discussions relating to the practices of their chosen trade occupied their attention.

To-day workingmen have common trade interests, and in some unions one will find that members discuss shop processes as a part of the regular evening program. The present Textile School at Lawrence, Massachusetts is the outgrowth of a small school organized by the Weavers Union and supported by it for a number of years. My first visit to the headquarters of a local trade union was a surprise and an inspiration. I had a preconceived notion that the meetings were devoted to agitation and to forcing industrial issues; but a library of up-to-date technical books, a class leader and a regular

course of instruction convinced me of my error. My conversion was complete when I was asked to give twenty lessons in advanced mathematics and I shall always remember with pleasure the earnestness of this group.

It is easily seen that students grouped according to occupation have an opportunity to talk over their trade interests, the teacher acting as a leader and drawing out the students into telling their trade experiences and through the expression of these various opinions obtaining the most practical solution of the particular problem at hand. Teachers who have had evening school experience know how difficult it is to get the students to recite and express themselves at the blackboard. A free discussion of the point at issue makes the student lose his self-consciousness and before he is aware of it he is at the board illustrating his particular method of solution. I remember in particular one teacher of steam boiler practice who aroused the greatest animation among the students by the obviously successful method of having them tell their industrial experiences with the particular type of boiler they were using. Each member was defending his method of firing and cleaning as though it was the only one—in fact, the discussion became almost bitter at times. The training in power of expression was not the least of the benefits. But of

course such discussions must be under wise guidance.

Special text books.

Five years ago there was not a text book written expressly for evening schools. Such books are appearing to-day, and more will come as teachers demand them. What is needed, for instance, is not an elaborate text book in general arithmetic, with all its topics of fractions, decimals, square root, percentage, interest, partial payments, bank discounts, etc., but rather a book which appeals to a man in the machine trades; one which appeals to a plumber, or a clerk, or an errand boy; small enough to slip into the side pocket of a coat and cheap enough so that he can readily own a copy for reference in his daily work.

What may be done.

We refer to the trade schools of Germany as being ideal; but we forget that the majority of these schools are evening schools where a portion of the day-school equipment is set apart for the use of those already engaged in the trades. Every industrial center in America could throw open the doors of its schoolhouses for its workers and offer instruction in the technique of the trades. And this is one thing that every city

within the limits of its school equipment can offer and should be willing to offer. The schools should open all their shops, their laboratories and their courses in science, mathematics and mechanical drawing to those who have the greatest need for the instruction which these facilities are designed to give. To most of those engaged in industrial occupations, who have experienced the lack of opportunity in the modern shop, such instruction as these schools could give would be a liberal education. A practical teacher in an ordinary school-room, with a class of industrial workers, in itself would form an evening trade school. With much expenditure of personal insight and force on the part of educators, and a little financial outlay on the part of the municipality, this country could develop the very thing that we discuss so freely and initiate so slowly. To every earnest workman such a plan would mean a certain degree of breadth in place of narrowness, increased power, greater self-respect, greater value to himself and those dependent upon him. Moreover, the young man, who has been stationed for five years at the same machine and might otherwise remain there ten years longer, is set free to range among a large number of machines and become familiar with them all.

Advantage of the plan.

It may be said that such schools are not trade schools in the most complete sense of the term. We may grant that they fall far short of answering the need for thorough and comprehensive industrial training for the youth of our country, for their pupils are limited to those already employed in the trades, who wish to improve their knowledge of the trade they follow, or, perhaps, fit themselves to take up a more profitable one. To supplement and facilitate shop training and to enable mechanics to do a high grade of work is the office of such schools. For this reason they will receive the support of employers of labor, who will welcome any means whereby their men may be trained to do a better quality of work. They will appeal to the men themselves, whose shop training has, for the most part, been limited to narrow lines, because they open the door to a wider range of practice, to a broader knowledge of their trade and to what naturally follows, a promotion with higher wages.

Making a beginning.

Already some day-schools which have well equipped shops and drawing rooms are offering night courses and are thus bringing to our attention a sensible solution of the relationship which should exist between factory workers and

the public schools. These schools will be instrumental in bringing about a more general system of trade instruction throughout the country because of their direct exemplification of the benefits of trade training, even if this training is given only to those who are already employed during the day in shops and factories. The plan need cost but little. The buildings and internal equipment already exist. There will be no cost of maintenance beyond the necessary heat, light, power, materials and instruction. Five years ago there were less than a dozen evening trade schools in the country making use of the shops and teaching force of the public day industrial and technical high schools. To-day there are at least twenty-eight such schools. May the number continue to increase. Classes are being conducted in machine shop practice, plumbing, patternmaking, cabinet work, electricity, drawing, shop mathematics, etc. The courses as laid out for these several departments are as thorough and complete as it is possible to make them in an evening school. The attendance upon these schools is very large and remarkably constant, being better than that in most night schools. In this way men already employed in the trades, who know, therefore, at least a part of the trade in which they are employed, are given an opportunity to broaden their mechanical training and to make themselves more efficient workmen.

X

A DECLARATION OF PRINCIPLES

IF the time has come and the conditions are ripe for the movement we have in mind we should organize it upon a plan that will work. If we have to compromise or exercise subterfuge in order to avoid issues, we are not yet ready for action, and, notwithstanding the pressing need of immediate entrance upon a comprehensive scheme of industrial education, let us wait until we are in a position where we can stand erect, look things squarely in the face and advance to certain victory.

In view of the facts and arguments presented in the preceding chapters of this book, it would seem that the following principles, suggestions and tentative plans may serve as a basis for further study and positive action.

Nature of the problem.

It must be admitted that the movement is primarily a problem in education and not merely a manufacturers' problem of supplying the present lack of skilled labor. It is not a problem to

be considered in any narrow educational sense, but rather in a comprehensive survey of the pressing needs of our schools, our children and our industries.

In no way will its proper solution cause any class distinctions in education, lower the present standard of education or cater to special interests. Rather it will develop a greater civic and industrial efficiency among our people than is possible under present methods.

Vocational education as a part of a public school system, should be made flexible and adaptable to all conditions—a system that should give equality of educational opportunity and should not limit its facilities to those who can stay in school in order to reap its advantages. Undoubtedly, we are called upon to-day to train our boys and girls in an industrial democracy, and our educational system will succeed just to the extent that we make it focus upon the needs of each member of this democracy.

A chasm to be bridged.

It should be conceded that a chasm exists between our educational system and our modern industrial life, and industrial education ought to bridge it. In the school we have, on the one hand, a number of discouraged boys and girls, abnormals, belateds and delinquents, finding themselves

unable mentally and physically to continue with credit in the culture process of our secondary schools; on the other hand, we find that science, invention and specialization continue to withdraw boys and girls from the oldtime "chores"—from former occupations which gave mental development, and to transplant them beside the automatic machine of our factories.

Selection of vocation.

Public education must concern itself with the proper selection of boys and girls to enter various callings in industrial, commercial or agricultural life for which their circumstances or natural abilities best fit them. There are economic as well as educational considerations, quite different from the usually accepted notions, concerning the functions and responsibilities of the ordinary schools. The recent agitation looking towards the establishment of vocational bureaus in connection with our public schools is in line with this thought.

Industrial education ought to awaken a new school interest and so help retain boys and girls in school longer and contribute more powerfully to their development. This training given to pupils of thirteen or fourteen years of age, when they are of little value in a business way, should prepare them to enter some branch of actual industrial work.

Conservation of children.

The conservation of our children is as important as the conservation of other natural resources such as water power, forests and mines. Reliable statistics regarding the number of pupils who drop out of our public schools, are lacking; but we know that the number is large and is a menace to our civic welfare. It is extremely difficult to hold children in school in those cities which have a large foreign population. It is believed that industrial training will have an economic value in the eyes of the parents which will assist in keeping children in school.

A justifiable expense.

Expenditure for vocational education is expenditure for civic improvement. There is a direct relationship between the earning capacity of our people and the expenditures for civic welfare. Our homes, churches, schools, streets, libraries, parks and other social betterments are supported by the people; a large share of the tax for the support of these institutions comes from our great industries and their workers. The number of persons engaged in gainful occupations in the United States is over 30,000,000, of which 36% are engaged in agricultural pursuits, 25% in manufacturing and mechanical pursuits, 19% in domestic and personal service, 16% in

trade and transportation and 4% in professional service. The wealth production on farms is $7,900,000,000 a year, while the gross value of the product of factories is $14,800,000,000. The wages of factory workers amounts to $2,600,000,000 a year, while the gross farm income is $4,200,000,000 a year. These values are increased and returned to the people by outlays on municipal improvements providing for greater civic efficiency. Still greater returns are received from money expended for industrial education.

No single solution.

If industrial education means a redirecting and adapting of our education to fit the economic and social needs of the people of varying communities, then it is a problem which has no single solution. There will be as many school classifications as there are groups of industries and nearly as many solutions as there are types of communities. There is no single inflexible course of study nor any single fixed line of procedure.

A look into the future.

Industrial education may well stand upon some such platform as has been suggested. At the same time we ought to keep in mind some sort of perspective. If the platform is solid and the

perspective is true, then it will be only a question of methods to accomplish the result. Let us take a look into the future.

It is universally agreed that the public school system is bound to be modified by the new external influences which will come from industrial education and that no real and lasting progress will be made in the latter until the schools are redirected in the interests of the people. They need education in terms of their environment,—the training of men and women along agricultural and industrial lines. It is not necessary to have an entirely new curriculum in order to redirect these schools. A portion of agricultural or industrial practice can be expressed in mathematical form; the study of history may take the form of industrial and economic development of the nation; geography can be taught in terms of environment; science in its relation to the great industrial processes upon which the lives of our people depend. One can conceive of an elementary school in which no so-called agricultural courses exist, which will still present the subject vitally from day to day by means of the customary studies and exercises. Real and lasting progress in industrial education will be made only when all schools, industrial or otherwise, concern themselves with the needs of human life, and in so far

as industrial education tends to vitalize the whole school system, so far will its effectiveness be beyond dispute.

An organic relationship.

Trade schools and industrial and agricultural schools must sustain organic relations with the public school system. This involves some modifications in the present plan of the schools in order to give this newer education a comfortable and useful place. We must examine carefully our present courses of study; note the essentials in subject-matter; the demand for different groups of subjects and the probable profit of each group to the state and its people. The result of the accounting will be that our school term will be lengthened; the courses will be simplified; they will be given an industrial trend through simple forms of handwork which can be done in the regular schoolrooms from the very beginning of the primary course. We shall find it to our advantage to give the children at all times work which appeals to their needs and aptitudes and they ought to complete the present work of the first six grades at an earlier age than now and thus enjoy a more extended and efficient school period than is now possible. Already New York and Massachusetts are devising ways and means of bringing about this readjustment.

A restratification.

Undoubtedly, this readjustment will present relation of the elementary and fields of education, for much of the disc the value of vocational training centers a wasted years of the child's life between fourteen and sixteen. Thus far, every plan proposed either provides that the fourteen year old boy and girl elect vocational training regardless of his or her previous school training, or states that only children in grades higher than the sixth school year shall elect such training. It is obvious that both of these propositions break down the present demarcation between the elementary and secondary fields.

Several plans have been proposed. It has been announced by the New York State Education Department that the school system may well begin to separate at the end of the sixth grade into three very distinct branches. The larger part of the work of the present two upper grades will be uniform, but some differentiation, looking finally to complete separation, will begin at that time. Three distinct courses of study, or classes of schools, will follow the elementary school period: (a) A high school system looking to entrance into college; (b) business schools looking to work in offices, stores, etc.; (c) industrial and agricultural schools looking to the training of

workers in these vocations. This plan involves that pupils in the "a" division will commence some study of a modern foreign language if they are headed for the literary and classical high school; that in the "b" division, some special commercial studies will be introduced for pupils headed for advanced business schools; and that in the "c" division, special training with tools and in the household and domestic arts will be offered for those who are to stop with the vocational school or who are to go on to the trade schools or agricultural high schools. This restratification will make it possible for pupils, teachers and parents to direct their energies toward the work that pupils are ultimately to do, and by the time the children have completed the eighth or ninth year they will find abundant opportunity to this end besides some enthusiasm for a school which qualifies them for their life-work, whether it be professional, industrial or along the lines of business activity. (See diagram on page 329.)

Articulation with labor laws.

Furthermore there should be the closest relationship between the state laws regarding the age of compulsory school attendance and any proposed laws relating to industrial education. All advocates of industrial education base their claims upon the years wasted between fourteen and six-

teen. There is little use in proposing a form of education, necessarily expensive and complicated, unless we strike at the root of the evil.

As far as possible, the employment of immature children in our industries, on lines of work which are not conducive to mental growth, should be prevented. Industrial enterprises which require intelligent individual effort on the part of young workers do not want the boy until he is sixteen years of age. Unskilled industries now take him when he is very immature and assign him to work which lacks educational content. Every boy and girl up to the age of at least sixteen should be engaged in work profitable to the body, mind and soul, or should be in a school which it is hoped may be even more profitable. School laws and industrial schools must work together; and child labor laws should be so modified that they will closely articulate with industrial school plans.

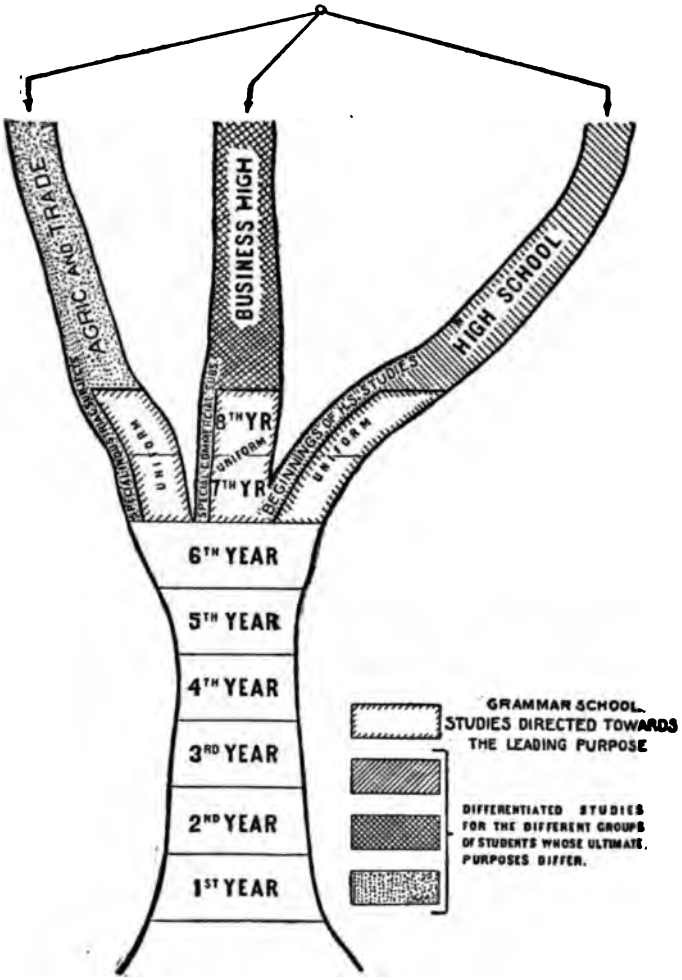
A new and important step.

Without any question, the most far-reaching phase of this new educational movement will be the establishment of continuation schools. Thus far in this country, we are totally unprepared for this type of industrial education. Before much can be done in this direction, laws will have to be enacted requiring employers to regulate their affairs so that their employees may attend these

Leading Purpose with Differentiated Studies.

The educational system may separate into three very distinct branches at the end of the first six years of the school course. The larger part of the work of the seventh and eighth grades will consist of the regular grammar school studies, directed toward industries, commerce, or the traditional high school courses, according to the leading purpose. In the present seventh grade there might be commenced some high school studies by pupils likely to enter the literary and classical high schools; some special commercial subjects by pupils headed for the advanced business schools; and some special training at benches with tools, in the household arts, and in elementary agriculture for those who are to stop with the elementary schools, or are to go on with the industrial or trade schools, or the schools of agriculture. At least half of the teachers in the seventh and eighth grades might be men; and these grades may well be housed in central and especially prepared rooms.

DIFFERENTIATED STUDIES LEADING TO



continuation schools at least four or five hours a week and receive instruction in industrial or academic subjects. Obviously, it is easy to make such a statement, but it is going to be difficult to devise a plan of procedure.

We are acquainted with the general scheme of German continuation schools. But Germany is not America, and manufacturers in this country are apt to feel that too many laws are already in the statute books along lines that restrict the rights of trade. At the same time, the problem of providing an education that will allow "earning and learning" will never be solved until there is some coöperation between a state educational policy and factory laws. It is within the limits of possibility that these continuation schools will be divided into four general phases:

First, evening schools for those who wish to supplement their daily experience with such academic and shop studies as will allow them to advance another round on the economic ladder, taking such courses as shop mathematics, mechanical drawing, and shop practice. This phase of continuation school work has been elaborated in the chapter on supplemental education.

Second, day continuation schools for those in our *unskilled* industries where they can receive instruction in civics, language and simple arithmetical processes. These courses will be for for-

eign born children or those who have had inferior school training, but need nevertheless such cultural subjects as have been suggested in order that the state may preserve its American citizenship.

Third, day continuation schools for those in our *semi-skilled* industries requiring a higher order of intelligence or offering opportunities for the exercise of a higher order if the young people fit themselves for it. Such schools will offer shop mathematics, drawing and simple courses in science. The present "schools in the factory" described elsewhere point to the industrial need and present a possible solution.

Fourth, public recreative centers and public evening lectures. Education for industrial workers must include a broader conception of educational values than the teaching of industrial subjects, mathematics, civics and language. It must take into consideration the profitable spending of the worker's hours of leisure. The deadening influence of work on the automatic machine can not be entirely eliminated by such studies as have been suggested. The preservation of our industrial democracy requires wholesome recreation for these people. Even industrial establishments have found that apprenticeship systems and industrial education do not adequately meet the problem. The significance of modern industry

has a social as well as industrial aspect. It has been treated in the chapter on the significance of modern industry.

To work it out.

A platform and a perspective have been presented. Methods of procedure are now in order. Naturally one questions why industrial education should be the concern of state or national government.

In the first place it ranks with the problems of state canals, highways, forest reservations and water power, for conservation of children is as important as the conservation of the state's other natural resources. Moreover if it is necessary to discuss such questions as finding foreign markets for our goods, importation of skilled labor and protecting infant industries through a protective tariff, surely it is equally important to study means of increasing the efficiency of the labor that enters into our marketable product, especially in view of the fact that there is a constantly growing proportion of labor cost to total production cost.

In the second place, the success of maintaining industrial education will depend upon state aid, for cities and towns will have to be encouraged by liberal state support. Generally speaking, no trade schools or agricultural schools have been successful without such aid. The equipment of

these schools is expensive, the salaries of their teachers are higher than in the common schools and other expenses of maintenance greater. More than this, it is well nigh impossible to educate local school boards to the point where they are ready to expend funds raised by a local tax for the entire support of a system of schools which is so obviously a great factor in the advance of the industries of the whole state.

It is clear that the state should aid local schools; for whether these localities take up industrial education or not is often a question of community ability, and no child should be disadvantaged by the locality in which he lives. Ratio of population to taxable property differs so widely that the state must see to it that the educational chances are evened up. However, the state should not pay all the expenses of industrial education. Local enterprise and responsibility should be developed.

Industrial, trade and agricultural schools must be close to the people. Educational democracy can not be realized if our people are required to attend schools at a great distance, where there is the expense of board and rooms, individual loss to pupils of home influence and loss to parents of that help which children often contribute outside of school hours. Moreover, the class of children which will enter these schools

cannot afford to go away to school and it is not best that they should. A central authority is needed to economize effort and properly adjust the work which various communities may contemplate. Care must be exercised so that there will be no such duplication of effort in closely allied communities as would cause educational waste. These schools should be planned with reference to the educational and industrial interests of the state as a whole. Unfortunately, in some states agricultural schools are springing up with no central educational body responsible for them. One town desires a school. It may be needed, but before it can obtain the money from the legislature the members of some other district insist that theirs should have a school as well.

The state and the nation.

It is an open question whether a state or the nation should provide financial aid for industrial education. As has already been mentioned, Congress is annually appropriating large sums of money for agricultural and mechanic arts colleges. Leaders are trained in such institutions and after graduation their labors are not confined to the state in which they were educated, and Congress may well undertake new work in states for the purpose of showing the way and stimulating local ambition when the work is of great magnitude. But in

industrial education of elementary and secondary type, it may be quite another matter. The demand for this education should, and usually does, originate in the local communities, and very likely it belongs to them to carry it out, for the people participating in this sort of education are not trained as leaders and do not immediately leave their school environment. It is quite another matter for these communities to go beyond the commonwealth and appeal to Congress. National aid is not usually given without an accompanying provision of some government control. The Federal Constitution by omitting all reference to the matter assumed that the states should control educational policy within their borders. It is nevertheless, a large question and the arguments are not by any means all on one side.

A vital point.

Into whose hands the state supervision of these schools should be placed is a question which can hardly admit of two sides, for it will be a serious mistake to commit the organization and administration of industrial schools to a special industrial commission and not to the public school authorities of the state and the subdivisions thereof. If the existing state boards of education are not capable of administering such education they should be strengthened by either the addition of

an advisory board or by a reorganization of the present board. For any progress a special commission is obliged to rely on local advocates and on local school committees; and it is needless to create an expensive commission for the purpose of accomplishing that which we have every reason for assuming can be accomplished without additional state machinery. Under special conditions, commissions charged with the special duty of investigation may well be organized, but, after reporting to state legislatures, they should be discharged leaving their recommendations to be incorporated in the general education law of the state.

Furthermore, it is inconsistent with our accepted theories of state and local government, to prohibit to the various communities of the state the same reasonable control over industrial schools which they tax themselves to support, as they exercise over their other educational enterprises. Industrial education should be kept as much as possible under local control and management, for otherwise there will be an implied reflection that local boards are not capable of managing educational affairs. Oftentimes, under special encouragement by the state and with the coöperation of local boards, it will be possible to adapt existing buildings to industrial school purposes and thus avoid duplication of plants such as would

exist if two state or local boards existed. Both the Massachusetts and New Jersey commissions found that small communities felt they could hardly afford to establish two distinct systems of education. It is not a wise procedure from any standpoint—educational or financial.

Shall we isolate it?

The next important consideration, and it is immense, is whether industrial schools should be separated from schools devoted to "general training." There is a tendency to divorce the two, and in this way the establishment of separate schools of agriculture and industry is repeating for the schools of lower grade that which has been the history of the development of the agricultural and mechanic arts colleges. The Land Grant Act of 1862 established the latter colleges. The new education resulting was so unlike the old education in spirit that new colleges were established independently of the old. In some instances, the new was made a department of the old institution. It did not thrive, the separate college being free to do as it chose. However, this was changed, and the separate agricultural college no longer holds the leadership, being strongest when allied with some university. In fact, the newer education has made many state universities. These institutions have found that education that

makes use of agricultural and industrial subjects is education quite as much and possibly more than that which was given in the terms of mathematics and philosophy. However, it is to be noticed that the agricultural colleges and schools connected with the universities are really schools within a school, each with its own dean, course of study, traditions and ultimate purposes.

Significantly, the recent movement for industrial and agricultural education has started out to repeat educational history. We are attempting to isolate this latest educational movement by organizing separate classes or schools. It may be wise to advocate special or distinct schools until they get their bearings, course of study, data, textbooks, and some traditions worthy of preservation; but everyone agrees that eventually much that there is in these schools must go into the regular schools. These new separate schools are going to be popular; they will be useful and significant, and more of them will be demanded.

But it will be a mistake to forever forbid a union of the old type with the new. On the other hand, it must be said that to attempt to incorporate industrial education in a school where it will be dominated by the older tradition will be to defeat a plan of education for industrial workers which has already been defeated twice in the

educational history of the past fifty years—once when the agricultural and mechanic arts colleges were established, and again when the manual arts were introduced. Possibly the times were not ripe. Many believe that to-day they are, and if industrial education is to succeed it must make its own traditions by creating a machinery that will do it.

Confidence of all interests.

It will be a false step to ignore the influence and support which trade unions can give to the movement. If based on broad lines, there is no reason for their failing to give their unqualified coöperation. If the state cannot develop a plan of procedure which will meet with the coöperation of employer and employee, of capitalist and of organized labor, then we may well ask who can. To make more effective this coöperation it will be best to include in the law the appointing of local advisory boards to assist in the administration of these schools. Such boards will serve a double purpose: (a) establishing in the community a confidence in the technical work done in the trade school, and (b) reinforcing the school board in its appeal before city governments for financial support.

Boy is the product.

The question of the disposition of the product of trade schools will be raised. Here again the procedure will depend upon the industry represented and the sentiments of the community. We must keep in mind that we are creating efficient workmen and not making products. If a finished product has to follow because of our educational ideal of the best way of making a finished boy, then it may be a wise and necessary procedure to make such products; but common sense and public opinion will govern the local situation.

Suitable teachers.

The obtaining of suitable teachers for these schools opens up a large question. Our normal schools have been organized on the basis that they were primarily intended for the training of teachers for the elementary schools. Some have special departments in which special training is given so as to qualify its graduates to teach school gardening, drawing, cooking and shopwork. The technical and industrial requirements of our industrial and trades schools are such that teachers must be very practical in their methods. In general, it may be said that it will be impossible for an average normal school to fit its students for teaching positions in the industrial and trades schools unless the students have had shop experience before

entering the school or obtain such experience after graduation.

There is no one who ought to be more qualified to teach in the trade schools than the competent, practical mechanic. But it is well to acknowledge that there will be some difficulty in obtaining such a man, especially in view of the fact that employers of labor find it difficult to obtain competent foremen. But no greater argument of the need of trade instruction can be advanced than to acknowledge that not even can a few men be found who are competent to be teachers. The same difficulty will be experienced in obtaining teachers for the bookwork in these schools. The average academic teacher has not received the training necessary to place the proper emphasis upon the application of science, mathematics, and shop accounts to various trades. There is a promising field for ambitious teachers who will qualify in this work.

But, to return to the shop teacher. He should be practical. But if he is merely this, his teaching may be a failure. If he was taught by the "rule of thumb," he will probably teach by the same rule. Even though he may have been taught scientifically, he may have no ability to impart instruction. If possible, no man should be permitted to teach who does not possess the following qualifications: Practical knowledge of his subject; skill in teaching; tact in the management of

boys and men; a good moral character, including freedom from all bad habits.

A general state movement looking toward the establishment of industrial and trade schools will require a large number of teachers. It is readily seen that no one source of supply will be sufficient nor will one particular method of training be advisable. There are many types of schools to be established. If the state accomplishes its purpose there will be schools for all the trades. In consequence, no single plan for training teachers will meet the conditions. Several projects are suggested.

The state normal schools may establish day courses for training teachers for industrial schools. Some are already equipped with shops, drawing rooms, and laboratories. However, they cannot be expected to train efficient industrial teachers unless the students electing the industrial course supplement their normal work with some practical experience in the shops. Conditions may be met in three ways: The student may have had his practical experience before he came to the normal school; he may get it after he has been graduated; he may work vacations and Saturdays in the shops of the vicinity.

Furthermore, these normal schools which are located near large industrial centers may have an evening department for training teachers by offer-

ing to ambitious and well educated mechanics of the vicinity an opportunity for study in the principles and methods of education and in the treatment of subject-matter, as related to the spirit and purpose of industrial education. Already Teachers College has established such a department.

In addition, evening continuation schools offer a splendid field for training and selecting efficient industrial teachers. Some of the best teachers in the present secondary technical schools have risen from the ranks of evening school teachers. In turn it may be said that evening school teachers have often been ambitious mechanics who have studied in correspondence schools and have seen the larger field of usefulness in the teaching profession.

Finally, there are some teachers in secondary technical schools and elementary manual training schools who would be qualified to teach in the trade schools if they had more grasp of the practical shop methods. This last qualification could be secured if they were to devote several vacation periods to actual shop practice in some model industrial establishment. Such practical training, combined with their knowledge of the principles of teaching, and their familiarity with boy life, would make them almost ideal teachers for these schools.

All that has been said with reference to training of male teachers for shopwork holds equally true

for the training of female teachers for girls' industrial work.

A bit of philosophy.

In conclusion, it may be said that industrial, agricultural and technical schools should be of every kind for which there is a demand on the part of the people. There will have to be nearly as many school classifications as there are groups of industries; nearly as many solutions as there are types of communities. We must keep in mind that simple and balanced justice makes it necessary to give to wage earners and to the common industries such equivalent as we can for what the present schools are doing for those with generous incomes and for the professional and managing vocations.

We are in the midst of a great task. We are working out the basis and the details of the greatest industrial democracy in human history. Let us lose nothing of our good humor and let us cultivate toleration of opinion and let us think straight, with an open mind.

BIBLIOGRAPHY OF VOCATIONAL EDUCATION

THE aim of this bibliography is to serve as an introductory reading list on the subject of vocational education. It attempts to present a list of books helpful to teachers, students and others interested in this phase of education, in a way that will give a grasp of the larger economic, social and educational questions that are at the basis of such training as is implied in the general title. The importance of the subject and its bearing upon fundamental questions of the hour forbid any less narrow treatment. Except in rare instances references to periodical articles are omitted.

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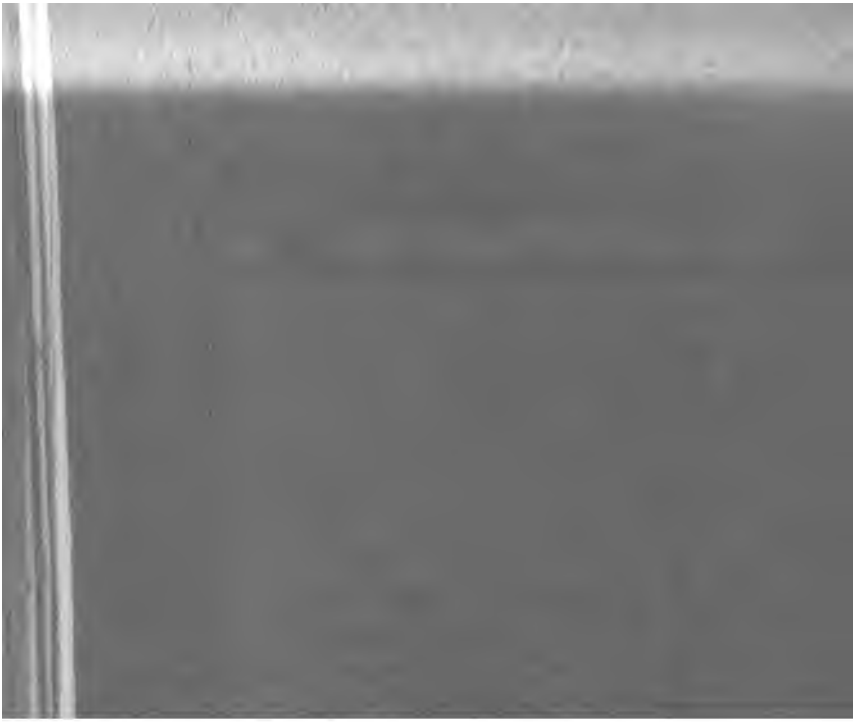

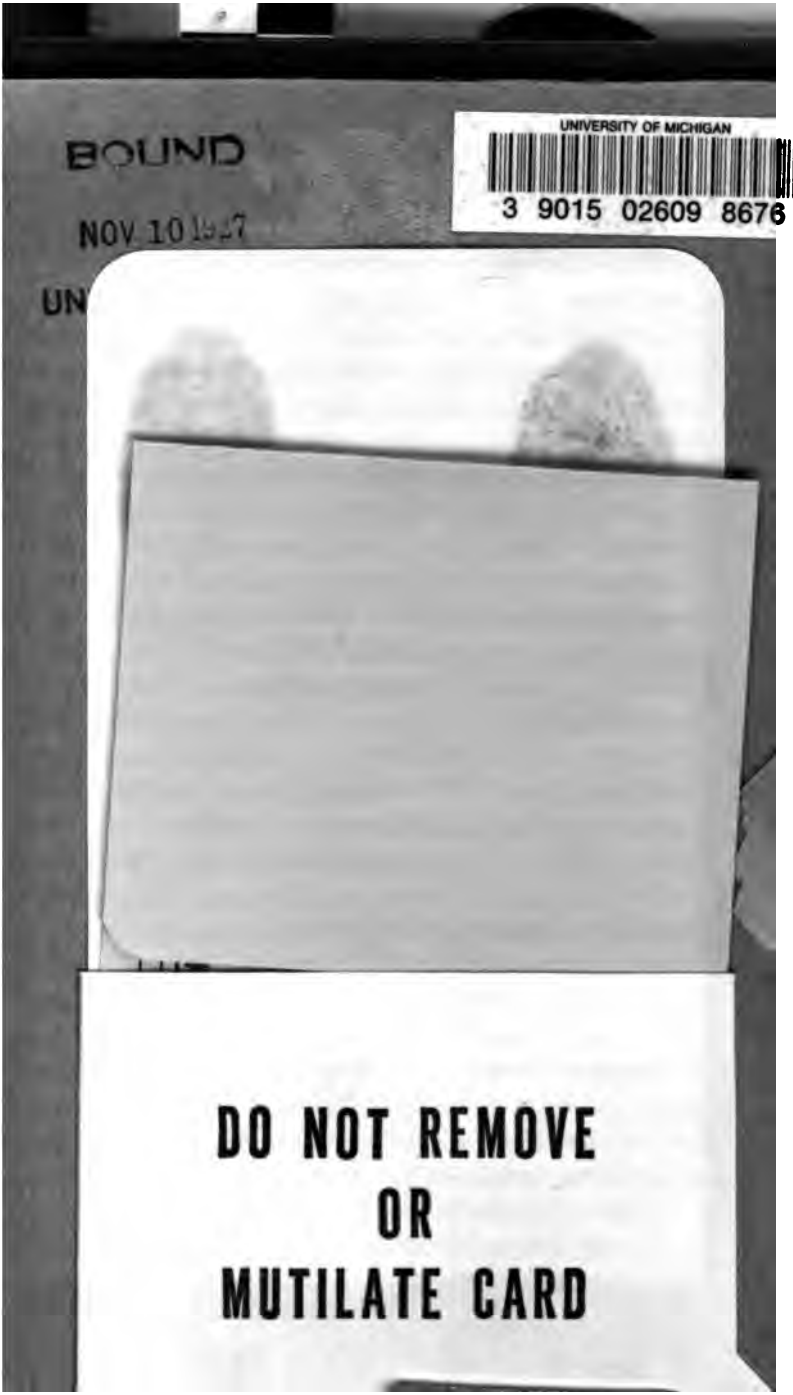
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